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Gas Journal

VOL. 293 | 110th YEAR | LONDON, MARCH 19, 1958 | No. 4940 | PRICE 1/6

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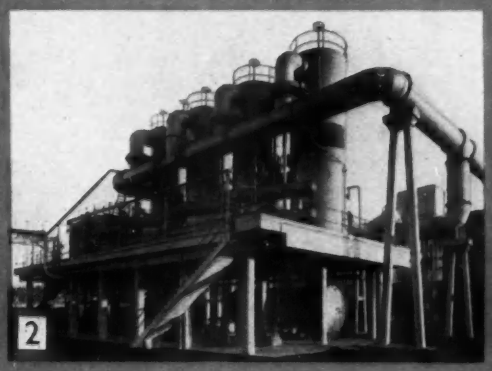

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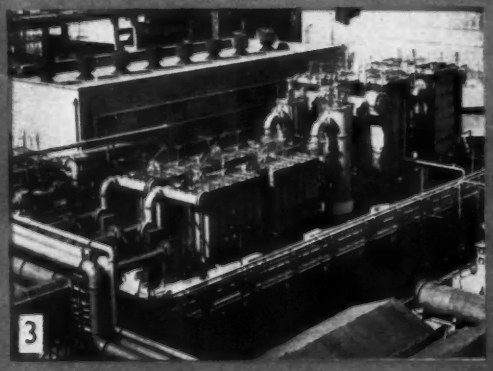
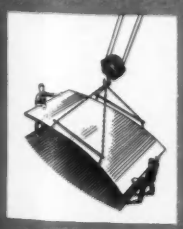


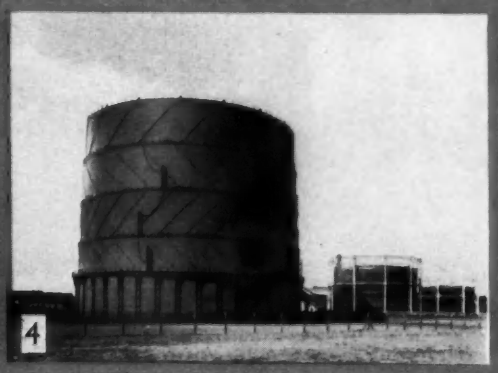


1: Benzole scrubbers built for Woodall-Duckham Construction Co. Ltd. for The National Coal Board at Chesterfield.

2: Gas Drying Plant built at Bromley for North Thames Gas Board.

3: Two complete purification streams supplied to Woodall-Duckham Construction Co. Ltd. for East Midlands Gas Board at Rotherham.

4: 3 million cubic feet capacity welded gasholder at Bishop Auckland for Northern Gas Board.



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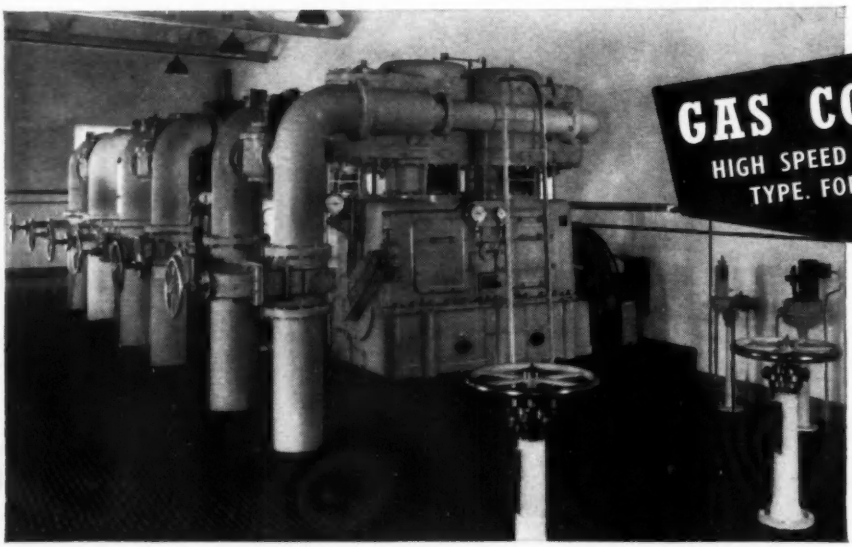

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Gas Journal

VOL. 293 NO. 4940 March 19, 1958

110TH YEAR

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Gas Journal

VOLUME 293. No. 4940. MARCH 19, 1958. 110th YEAR

The Gas Industry and the Press

GAS has been in the news lately and in a manner unlikely to do the industry much good. Stories of one or two incidents have been splashed on the front pages of our newspapers and as is usual when this happens, additional prominence is given to what one might rather callously call run of the mill gassing fatalities. Such things have a nasty habit of snowballing. On this occasion it lead Mrs. Lena Jeger to ask a question in the House. She wanted to know how many people died in 1957 as a result of accidental (as distinct from suicidal) gas poisoning, and what steps were being taken to reduce these fatalities. She was told by Sir Ian Horobin, Parliamentary Secretary to the Ministry of Power, that the figure was 572 (which was lower than the previous year's) and that education and research aimed at safeguarding consumers was in progress. His answer did not satisfy Mrs. Jeger; nor did it satisfy the *Manchester Guardian* which described it as 'unhelpful' and remarked that 'there can be few consumer services which bring so much hazard to their customers.' All this leaves a nasty taste in the mouth, and leads us to wonder how good are our relations with the Press, for it is they who can make or mar our reputation in matters of this kind.

There can be little doubt that in many respects the gas industry's contact with the Press is a happy one. Most—just at the moment one certainly cannot say all—new developments, particularly those of national interest, are put over effectively and achieve the right sort of publicity. But what about Press relations at area board level? Here one can go in for a little grading, all the way from excellent to abysmal. For the purpose of this note, however, we want to come still further down the scale and deal with liaison between gas undertakings and the local Press. Even under nationalisation a great deal depends on the attitude and aptitude of the local manager, engineer or sales officer in such matters.

The first point to remember is that a newspaper has a dual function—to inform and entertain its readers, and to bring sellers and buyers together through the medium of the space it sells to advertisers. It is important to distinguish between genuine news and advertising thinly disguised as news. Few editors tolerate the latter, unless perhaps a substantial advertiser is involved. Nevertheless, in a small community information concerning important new customers, outstanding installations, council contracts, and news about gas undertaking personnel can be acceptable to the local paper.

What about 'bad news'? One must first appreciate the fact that what is bad news to you is probably just news to other people. If something unfortunate happens, say an accident, the smart thing to do is to tell the Press at once, honestly and in full. In that way you can ensure that newspaper reports will present the facts accurately. Attempts to hush up bad news are nearly always doomed to failure. Basic information can usually be obtained from the police, fire department, or hospital; refusal to fill in the details can do a gas board a lot of harm and will force the newspapers to elaborate the story with help of less reliable sources of information. On the other hand, it is quite legitimate to tell a newspaper that an investigation is in progress and that the facts will be divulged after they are correctly determined. You will be protecting yourself and the newspaper as well, since erroneous information in print is equally damaging to a newspaper's reputation. But you must keep your word and let the newspaper know the facts quickly when they do become available.

Now for some of the things you should try to do. Treat newspaper men courteously and with the same consideration you would give to a valuable consumer. Use good photographs whenever possible and keep a few 'head and shoulder' prints of key officers in the division or district handy. Have your story typed, double space, on one side of the sheet of paper. It should always carry your name, the board's name, address and 'phone number; and indicate whether the

story is for immediate release. Picture captions should be brief yet give all the essential information; people in a picture should be identified from left to right. Make sure you submit your story to all newspapers in your community.

If you appreciate tips about new customers and prospects, give your newspaper tips about news in which you or your business are not involved. Help the editor whenever possible—it may pay off one day.

After the do's, the don'ts. Don't demand that a newspaper uses your story. Don't be disappointed or outraged if the story doesn't get into print, or if it appears in print much shorter than you expected, or if you have been misquoted—newspaper men can make mistakes as well as you can. Don't think you are entitled to free space in the news columns just because you are an advertiser; suppose a consumer insisted that because he bought a lot of gas, he should therefore get some free once in a while.

The points we have mentioned are admittedly elementary. But they are all points which are regularly overlooked by sections of the gas industry, whether area boards or individual undertakings. We suggest that adherence to these rules will go a long way towards overcoming some of the difficulties discernable in our newspapers in recent months, and ensuring that gas gets the best possible publicity in the Press.

Wanted—A Yardstick

FROM time to time in these columns we have commented on the inadequacy of many salaries in the gas industry and on the way in which this situation affects recruitment of personnel of a quality likely to give the industry the stimulus it will need in years to come. Although in general salaries tend to be low this is not in itself the most striking feature of the situation. What sticks out a mile is the degree of variance in what is considered adequate remuneration between one board and another. This variation would seem to have little to do with any difference in the cost of living between the north and south of the country—quite rightly as it happens, since such differences are grossly exaggerated. Indeed, there appears to be no yardstick by which salaries can be measured against the responsibility entailed and the qualifications required. A certain sort of job at a certain sort of works in one area carries a salary wholly different from an identical job in another area. Discrepancies of this kind do not occur in the electricity industry, at least to the same extent, or indeed in most other industries.

The 'Appointments Vacant' column of the 'GAS JOURNAL' makes interesting reading. For example, we noticed recently the post of assistant works manager at a 17 mill. cu.ft. a day works being offered at a salary of £945-1070 per annum. Applicants were required to have had experience in the control of modern works, and be corporate members of the Institution of Gas Engineers. In other words, this was a post carrying a very considerable amount of responsibility, including that of being in sole charge of the works during the works manager's absence; from what we know of the works in question there is only one assistant works manager. What interests us is that the salary scale quoted related to gas staffs, whereas we would have expected it to be a scale for gas officers at a figure of £200 or so more.

No doubt that appointment has been filled and everyone is now happy. But we still maintain that this sort of thing is out of step with the general situation obtaining in the industry, and still more so with conditions elsewhere. It all comes back to the same thing—there is no sensible salary pattern.

Demonstrator Extraordinary

IT is remarkable how cookery demonstrations have been developed and improved during recent years. Techniques have been speeded up, more thought and rehearsal have been devoted to the commentary or patter, and the performance has been spiced with a substantial measure of showmanship: If this is true of the demonstrations given by the host of talented young ladies who show by example the merits of all sorts of foods, fuels and fittings, it applies even more to the handful of topliners in the game who have succeeded in building a cooking operation into a polished stage act. With such people there must be gimmicks. Beards, evening dress—anything will do as long as it is 'different.' However, with performers of this kind there can be snags. Such demonstrators almost always have sponsors whose products they are supposed to bring to the audience's attention. The difficulty arises when the demonstrator forgets (accidentally or on purpose) to sell his sponsor's product and sells himself instead. Some of the bigtimers in this line of country seem to consider it beneath their dignity to descend to a little genuine promotion.

These thoughts are prompted by another visit to see the man we believe to be as good a *selling* demonstrator as anyone in the business—Jean Conil. We have seen this famous chef a number of times, and on every occasion he has effectively combined expert cooking with a series of first-rate commercials. For him there are no passing references to products. On the contrary M. Conil stares his audience straight in the eye and gives them the works.

Recently he has been touring in what might be termed a 'package' show, sponsored by a number of firms, including Radiation. Quite clearly M. Conil knows his cooker and is prepared to explain to his audience just why he likes gas for cooking and this gas cooker in particular. He neatly fits these plugs into a programme which includes expert patter and a variety of tricks of the trade, some of them peculiarly his own—we have never seen anyone else chop parsley to music on stage! It costs a lot of money to publicise and put on slap-up demonstrations in decent theatres and halls. The sponsor is fully entitled to expect his money's worth With M. Conil he gets it.

Mention of Radiation reminds us that this Company which has made a real effort to get new ideas for sales demonstrations, has come up with a full-scale play, which has been produced in exactly the same way as any other stage production. For perhaps the first time actors have been taught to cook; usually it is the other way round. 'Fare Play,' as the production is called, was launched at Colwyn Bay recently and received an enthusiastic reception. After a Welsh tour it is coming to other gas board areas.

Personal Notes

MR. F. G. BREWER, O.B.E., who has been Secretary to the Gas Council since its formation in 1948, will retire from that office at the end of September. The Council has appointed as his successor the Chief Accountant of the Council, MR. WILFRID BAILEY. Mr. Brewer was educated at the City of London School and at Gonville and Caius College, Cambridge, where he was senior classical scholar and graduated in the first division of the first class of the Classical Tripos. In the first world war he served with the Inns of Court O.T.C. and the Royal Artillery. After demobilisation Mr. Brewer was for a short time in the secretaries' office of the Board of Inland Revenue. In the autumn of 1919 he was appointed to the staff of *The Times*. Apart from his editorial and secretarial duties, he represented the paper as special correspondent on tours at home and abroad. Before being appointed Secretary of the Gas Council Mr. Brewer was Secretary and Assistant General Manager of the South Metropolitan Gas Company. His O.B.E. was announced in the 1957 New Year Honours. Mr. Bailey has held his present office with the Gas Council since July 1, 1949. He was appointed from the position of Chief Finance Officer of the Crawley Development Corporation. Previous positions have included those of Deputy Borough Treasurer of Willesden and Borough Treasurer of Bexley.

MR. C. E. CAREY, Chemical Products Manager of the South Eastern Gas Board, is this year's Master of the Worshipful Company of Paviors.

Mr. Wilfrid Bailey.

MR. HECTOR MCNEIL has been appointed Managing Director of Babcock & Wilcox, Ltd. He succeeds SIR KENNETH HAGUE, who has expressed the wish to relinquish this position, which he held since January, 1945. Sir Kenneth will continue to devote his services fully to the Company as Deputy Chairman. Since 1953, Mr. McNeil has been a Member of Council of the Institute of Fuel, was Vice-President of the Institute from 1953 to 1956, and became President in 1957. MR. J. STEWART ROBERTSON, General Manager of Babcock & Wilcox, Ltd., has been appointed a Director to fill the vacancy created by the retirement from the Board of Directors, at his own request, of MR. C. H. SPARKS, who has been a Director for the past 18 years.

MR. R. H. PITCHFORD, an Assistant O. & M. Officer with the West Midlands Gas Board, is one of the two joint winners of the Sir Joseph Burn Prize for 1957, the Office Management Association announces. He is the second person employed in the gas industry to win this prize since it was instituted in 1956.

MR. H. P. LORD has been appointed General Sales Manager by Sigmund Pumps, Ltd.

Obituary

MR. RUPERT JAMES ROGERS, who enjoyed a long and distinguished career in the gas industry, died in Birmingham on March 11, aged 73, after a short illness. Mr. Rogers was born at Melton Mowbray in 1884. He entered the City of Birmingham Gas Department in 1905 and became Fittings Superintendent in 1918. He joined the Parkinson Stove Company as Managing Director in 1932 and was appointed Chairman in February, 1948. In 1947 he was appointed to the Board of Parkinson Cowan Ltd., and he remained actively at work to within a few weeks of his death. He served professional institutions with sustained enthusiasm. He was Chairman of the Society of British Gas Industries, 1937-38, and President of the Institute of Vitreous Enamellers, 1946-48. Through the whole of his working life he maintained an intense loyalty to the gas industry, in which he occupied a unique place in the affections of his contemporaries and of all those who knew him, and displayed a keen but kindly judgment of men and affairs. He had a delightful sense of humour and took as much pleasure in the company of others as he himself afforded.

GAS SALESMEN'S TROPHY AWARD

ENTRIES for the Gas Council's Challenge Trophy should be submitted in quadruplicate to Mr. R. J. Gregg, Publicity Manager, the Gas Council, not later than March 31. The award will be made to the author or authors of the best paper read at any gas salesmen's circle meeting during the 12 months ended December 31 last.

The adjudicatory panel comprises: Mr. M. L. Coates, Commercial Liaison Officer, Eastern Gas Board; Mr. R. H. Bone, Commercial Officer, Scottish Gas Board; Mr. R. S. Hinder, Press & Information Officer, the Gas Council; Mr. Brian Hill, Publications Officer, the Gas Council; and Mr. R. J. Gregg, Publicity Manager, the Gas Council.

In the case of joint authorship, the entry must consist of a composite paper.

Diary of Forthcoming Events

March 20.—INSTITUTE OF FUEL (EAST MIDLAND SECTION): Loughborough College. 'Small Pressurised Water Atomic Power Plants.' 7.15 p.m.

March 22. — NORTHERN JUNIORS: Sunderland. 'Communications,' by Mr. H. B. Buttall.

March 22.—WESTERN JUNIORS: Joint Meeting with the WALES AND MONMOUTHSHIRE ASSOCIATION: Aberavon Works. Luncheon 1.15 p.m. Visit to the Aberavon gasworks at 3.15 p.m.

March 24.—WEST MIDLANDS G.C.C.: Edmund Street, Birmingham 3. Meeting at 2.30 p.m.

March 24.—WALES & MONMOUTHSHIRE JUNIORS: Holywell. Paper by Mr. F. W. Stobart.

March 25.—MIDLAND JUNIORS: Staff Mess Room, Birmingham. 'The Southern Gas Board in 1957,' by Dr. A. E. Haffner. 6.30 p.m.

March 26.—INSTITUTE OF FUEL (YORKSHIRE SECTION): Royal Victoria Hotel, Sheffield. Annual General Meeting, 2.30 p.m.

March 26.—INSTITUTE OF FUEL: 'The Dewatering of Fine Coal,' by Dr. V. R. Gray. The Institution of Civil Engineers, Gt. George Street, S.W.1., 5.30 p.m.

March 27.—NORTH THAMES G.C.C.: Westminster City Hall, London, W.C.2.

March 27. — INSTITUTE OF FUEL, MERSEYSIDE SUB-SECTION: 9, The Temple, Dale Street, Liverpool. 'Process Steam,' by L. G. Northcroft, O.B.E., followed by annual general meeting. 7 p.m.

Gravesend Works to Go

The South Eastern Gas Board's works at Gravesend will close at the end of the month after more than a century's operation. Until the Board's new works at the Ise of Grain are completed later this year, Gravesend will get its gas from the South London transmission grid. The works originally belonged to the Gravesend and Milton Gas Light Company, which started supplying gas to the area in 1824.

Darlington Gasworks to have Six New Concrete Coke Bunkers

SIX reinforced concrete coke bunkers covering an overall plan area of 105 ft. 6 in. by 27 ft. 9 in. are being built at the Darlington works of the Northern Gas Board by Thomas Fletcher & Co. Ltd., of Mansfield, on behalf of the main contractors, Robert Cort & Son Ltd., of Reading. Each compartment has a capacity of 85 tons and the widths vary from 14 ft. to 20 ft. according to the density of the graded coke contained.

The bunkers are carried on 14 reinforced concrete columns positioned in line with the cross walls between bunkers. A lagging platform below the bunkers extends the full length of the structure and the screen house which is positioned centrally over the bunkers occupies a reduced width of 17 ft. The screen house is single storey for 50 ft. and two storey for the remaining length of the structure. The total height to the higher roof level being 73 ft. 4 in. above datum.

Cantilevered Roof

The whole structure including bunkers, beams, walls, floor, and roof slabs is constructed in reinforced concrete with the exception of the cantilevered roof at the bagging platform which is to be covered in aluminium sheeting.

An isolated 13-ton breeze hopper, also junction tower and four conveyor trestles each 30 ft. high are constructed in reinforced concrete. The tower and trestles have been designed to withstand horizontal pressure from a coke stock pile 30 ft. in height.

Robert Cort & Son, Ltd., were responsible for the mechanical plant layout and general arrangement and the design engineers were the British Reinforced Concrete Engineering Co., Ltd., who also supplied the reinforcement.

15,000 Inspections

In its campaign to reduce gassing accidents, the Scottish Gas Board has carried out 15,150 inspections in the houses of the aged and infirm in North and North-East Scotland. An average of nearly two faults per household, mostly of a minor nature, were discovered and corrected.

OIL HYDROGENATION PLANT TO BE ERECTED BY S.W.G.B.

AN oil hydrogenation plant is to be erected at Bristol, Gloucester, or Plymouth, the Chairman of the South Western Gas Board, Mr. C. H. Chester, announced at a meeting of the Gas Consultative Council at Taunton, last week.

A research development programme had been approved by the Board, the Gas Council, and the Ministry of Fuel and Power, Mr. Chester stated. He had set up a team of four experts to work in conjunction with the Midland Research Station of the Gas Council, at Solihull, and the design of the plant was going ahead.

WESTERN JUNIORS VISIT STROUD

Members of the Western Junior Gas Association pictured when they visited the factory of Waller and Sons, Stroud, recently, with their President, Mr. J. B. Taylor.

Soviet Experts in Underground Gasification Visit Britain

A PARTY of five Soviet experts in the underground gasification of coal, together with a woman interpreter, are in England on a two weeks' visit as guests of the National Coal Board. A British team spent a fortnight inspecting installations in Russia last November.

The Russian visitors were met at London Airport last week by Mr. J. Norval, Chairman of the National Coal Board's Underground Gasification Executive, and leader of the British team to Russia.

The Party

They are Mr. G. A. Stetsenko, interpreter in charge of English editions at the Publishing House of Literature in Foreign Languages; Mr. N. V. Kalmykov, head of the technical department, Glavgas (the organisation controlling the U.S.S.R.'s gas industry); Mr. O. V. Kruglov, Director, Lisichansk underground gasification station; Mr. N. A. Federov, Director, Vniipodzemgas Institute (underground gasification research); Mr. N. V. Lavrov, Deputy Director, Institute of Combustible Miners; and Miss O. B. Nikiforova, the interpreter.

During their stay in this country they will see the experimental underground gasification site at Newman Spinney, Derbyshire, gas industry plants in London, Solihull, and Birmingham, and also visit a number of chemical engineering firms and research laboratories concerned with gasification problems.

The party is due to return to Moscow on March 30.

CANADIAN NATURAL GAS WINS THREE NEW CONTRACTS

A CONTRACT has been signed providing for the delivery of a total of 18,025 mill. cu.ft. of natural gas to the Spruce Falls sulphite pulp and newsprint mill at Kapuskasing, Northern Ontario, over a 10-year period. Total cost will be $7,748,960.

This was announced recently by Mr. G. M. Minard, Vice-President of the Spruce Falls Power and Paper Company, and Mr. Ralph K. Farris, President of the Northern Ontario Natural Gas Company.

Two other industrial contracts have been made by the Twin City Gas Company, an affiliate of Northern Ontario Natural Gas. These contracts provide for the delivery of natural gas to three Lakehead mills of Abitibi Power and Paper Company and to Canada Malting's plant at Port Arthur.

Clean Air in the N.W.

DINNER TO MARK END OF CAMPAIGN

A DINNER to mark the closing of the North West clean air campaign, initiated by the National Society for Clean Air, will be given at the Adelphi Hotel, Liverpool, on March 25. The campaign has been operating since last August. The exhibitors included the North Western Gas Board.

Speakers at the dinner will include:—Alderman F. H. Cain, Lord Mayor of Liverpool; Professor A. B. Semple; Alderman Mrs. E. M. Braddock, M.P.; Alderman Simon Mahon Jnr., M.P.; and Mr. Arnold Marsh, M.Sc.

Eastern Juniors Visit W. H. Allen Sons & Co., Ltd. at Bedford

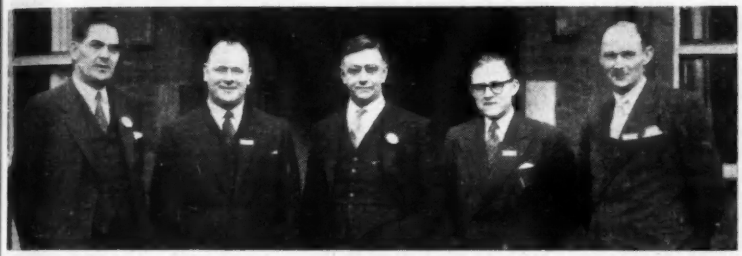
THE Eastern Junior Gas Association last week visited the Bedford works of W. H. Allen, Sons & Co., Ltd. They were welcomed by Mr. K. Rowell, Director, who spoke of the continuing and happy relations between the various gas boards and his firm.

The President of the Eastern Junior Gas Association, Mr. J. L. Ireland, in his reply, gave operating results from the recently commissioned 1,000 kW pass-out turbo alternator at the Lincoln works of the East Midlands Gas Board. He said that during the first two months' running a .25 mill. kilowatts surplus to works requirements had been exported to the electricity grid. Additionally stand-by steam raising plant had been shut down with a resultant saving.

At the end of the visit, Mr. W. J. Spiller, Works Engineer, Cambridge, thanked Mr. J. R. Wheating, the Assistant Sales Manager, for his excellent arrangements referring, in particular, to the staff who had acted as guides.

The visitors saw both of the Company's works in Bedford—Biddenham works where they were shown the gas turbine assembly and development shop, gas turbine test bay, and fluid flow laboratory; and Queen's works where among other things they saw the light and heavy machine shops, steam and pump test bays, diesel test bay, electrical shop and test bay, metal and steel plate shop, and apprentices' training centre.

All the Company's products—steam turbines, steam engines, diesel engines, gas turbines, electric generating plant and control gear equipment, gears, and pumping plant, are familiar throughout the gas industry. To mark the visit the Company prepared two illustrated brochures regarding their activities.



Pictured during the visit are (left to right) Mr. J. M. Berridge, the Company's East Midlands Sales Representative; Mr. J. L. Ireland, President, Eastern Junior Gas Association; Mr. K. Rowell, Sales Manager and Director of the Company; Mr. B. Clarke, Divisional General Manager, Lincolnshire Division; and Mr. D. W. Ault, Divisional Engineer, Lincolnshire Division.

Fuel Efficiency Service Organises Four-day Residential Conference

A FOUR-DAY residential conference for works and plant engineers, to be held at Portstewart, Co. Londonderry, in May, has been organised by the National Industrial Fuel Efficiency Service to provide an opportunity for technical staff and management of industrial firms and other large heat and power users to obtain up-to-date information on recent developments in the efficient use of heat and power.

Subjects to be covered are: Instrumentation; the preparation, supply, and delivery of solid fuels; supply, delivery, and handling of liquid fuels; steam generation and utilisation of heat; utilisation of electricity; utilisation of gas; and space heating.

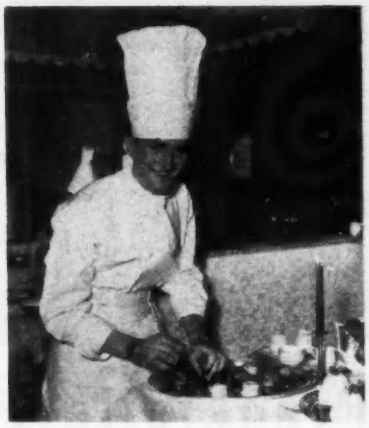
Members attending the Conference will be divided into small syndicates. After the first paper a problem will be propounded involving the selection of boiler plant and fuel for a given works.

Relevant data as to works, costs of fuel, labour, etc., will be provided at the Conference (not with the advance papers). Syndicates will be asked to develop their own views on the economic advantages of choice of fuel, the working pressure of plant, and the necessary instrumentation to be adopted.

The papers will be issued for advance study two weeks before the Conference to those attending. Following the Conference a record of debates will be issued to those who have attended. As the Conference is residential, ample opportunity will be provided for informal discussion outside the set programme.

£210,000 Expenditure

PROJECTS totalling £209,969 approved by the Scottish Gas Board during the last three months were reported at a recent meeting of the Scottish Gas Consultative Council in Edinburgh on March 5. Divisional figures were—Glasgow and West, £127,594; South-West, £44,669; Edinburgh and South-East, £21,445; Central, £8,234; Aberdeen and North, £8,027.



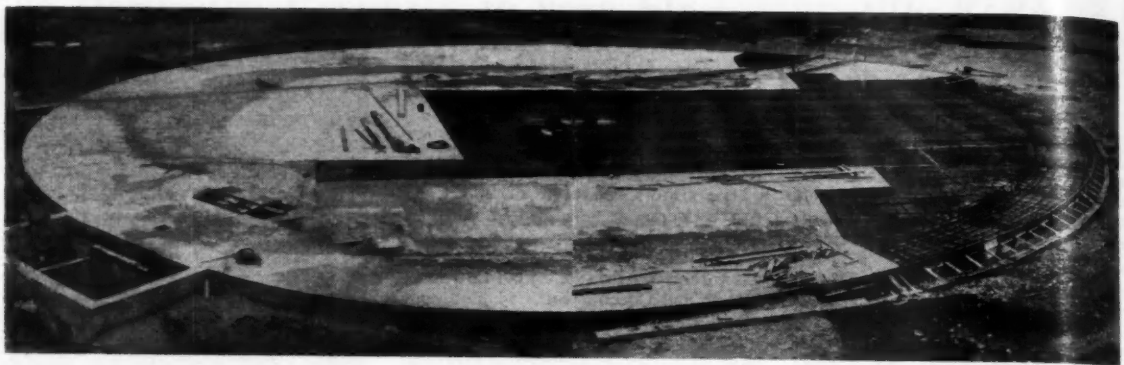
The only boy, Peter McVey, of Croydon, beat six girls to win the South Eastern Gas Board's area final of the Youth in the Kitchen contest, at Bentalls Ltd., Kingston, last week. Aged 19, he wins out of a total of 6,469 boys and girls from the area. In the first Youth in the Kitchen competition four years ago, he came fourth in his divisional final. The seven gas equipped kitchens which the competitors used, together with a model kitchen and dining annexe, are being retained by Bentalls for a week as a special exhibition.

THE HEATING AND VENTILATING RESEARCH COUNCIL

IN their recently published second annual report, the Heating and Ventilating Research Council state that research work has been established on a firm basis, and that projects in hand are to be further extended.

The highest priority has been, and is being, given to intermittent heating, a subject embracing both heating and ventilation practice. Other projects initiated during 1957 included the design and performance of high velocity ventilation systems and the study of the application of automatic controls to heating and air-conditioning plants, the latter having developed logically from the intermittent heating investigation.

Pictured above is a character well known to the gas industry—4 ft. 10 in. Harry 'Tich' Liverain of Radiation Group Sales Ltd. Sixty years ago 'Tich' joined the Eagle Range & Grate Co., Ltd., as a fitter; he is now nearly 78 years of age.



This base was built on Frankipiles for a gasholder 114 ft. 6 in. in diameter.

Frankipile Foundations

A METHOD WHICH HAS ENABLED BUILDING ON 'UNUSABLE' SITES

THE Franki Compressed Pile Co., Ltd., since its incorporation in 1931, has been responsible for contracts involving the driving of 400,000 Frankipiles, which support between 25 and 30 mill. tons of buildings. Of these piles 300,000, or 75% of the total, have been driven in the decade 1945-55.

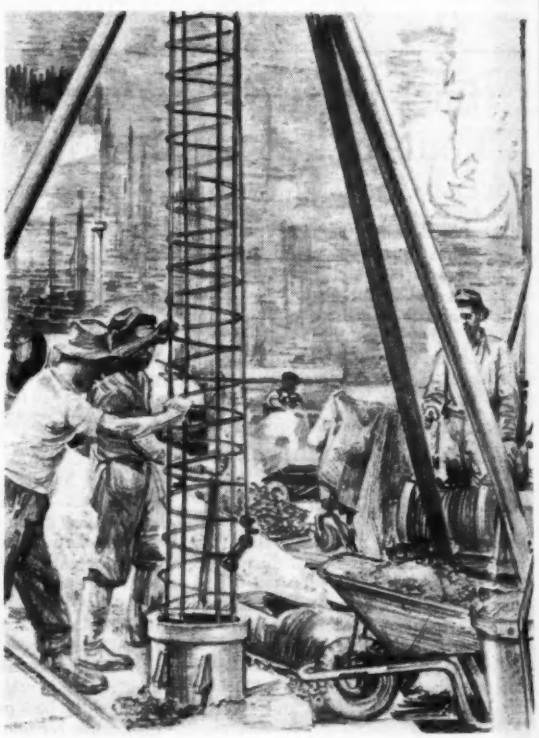
The tendency to build larger industrial units and to install heavier machinery in modern factories, and the fact that siting has had to be extended to sites hitherto considered unsuitable are, of course, fundamental reasons for the increased demand for piled foundations. But the magnitude of this increase in demand for their products obviously implies a special interest in this Company's methods of piling foundations.

Waste of Materials

The conventional type of pile, which superseded the wooden pile about 70 years ago, is made of reinforced concrete precast on site or factory made and transported to the site. This pile is of suitable length and cross-sectional area to carry the calculated weight of the proposed building and to be driven down to a suitable depth to reach load-bearing strata. It involves a good deal of concrete and reinforcement to stand up to the process of driving and if the set is less than the length of the pile, it involves much time in cutting off the head projecting above the ground—as well as a waste of materials.

Three Methods

The method of pile driving which has been developed by the Franki Compressed Pile Co., Ltd., would seem to avoid these and other disadvantages. Of the three methods used by the Company, two consist of making the pile *in situ*, or forming the pile from concrete and steel reinforcement in a hole which has been taken down to the required depth. The third method consists of the pressing into the ground, in places of very constricted headroom, short length precast piles 2½ ft. long by



hydraulic jacks, until a pile of suitable length has been built up from these short lengths and the predetermined resistance in the ground has been reached as shown by the pressure gauge on the hydraulic press.

The *in situ* piling methods are divided into 'driven' and 'bored.' In the first method a tube of suitable diameter and length is taken and into the bottom of it is put from 2 to 3 ft. of dry gravel. This gravel is now compacted by light blows of the cylindrical drop hammer, which is some 20 ft. long and 2 to 3 tons in weight. The friction between the compacted gravel and the sides of the tube makes it possible to drive the tube into the ground to the required depth by increasing the weight and intensity of the blows on the gravel by the hammer.

Plenty of Cover

When the tube is at the predetermined depth, wires are attached to lugs at the top of the tube to suspend it independently of the direction of the hammer motion. By continuing the driving the gravel is eased out of the bottom of the tube and forced into the earth. This is consolidated by introducing semi-dry concrete into the tube and compacting this with the hammer to form a bulbous foot to the pile. Mild steel reinforcement, consisting of four vertical rods $\frac{3}{4}$ in. in diameter and $\frac{1}{4}$ in. helical binding at 6 in. pitch is now introduced into the tube.

The pile shaft is now formed by successive charges of semi-dry concrete being introduced into the tube and rammed down by the hammer as the tube is gradually withdrawn. The diameter of the finished pile shaft is always greater than the tube, which provides plenty of cover to the reinforcement.

Necessary Headroom

Finally the tube is completely withdrawn and the pile finished off to a height of about 2 to 3 ft. above the ground to allow the placing of the pile cap or bonding it into a reinforced concrete platform. For this method, it is necessary to have at least 30 ft. of headroom to accommodate the piling frame.

Where headroom is limited and it is unsafe to cause any vibration which would disturb neighbouring structures or foundations the bored *in situ* pile can be used. A rig consisting of shear legs, a portable haulage or winch, hammer, open ended sections and a cylindrical coring tool is used in this method. A hole is formed in the ground by repeatedly dropping the coring tool under its own weight from the shear legs. When it is full of earth, it is emptied and the first of the hollow cylindrical sections placed in the hole. A driving head is fitted to the first section and a rail or channel is inserted horizontally in the hole of the coring tool. As the operation continues, the coring tool removes the earth below the cylindrical section and at the same time tamps it further into the hole being formed.

Successive cylindrical sections are added until the required depth is reached a few feet below the bearing stratum. The bottom of the tube so formed is sealed off and any water it may contain is pumped out. The rest of the process consists in forming the bulbous foot and pile shaft by direct mechanical compaction of semi-dry concrete. For this purpose a cylindrical hammer about 4 ft. 6 in. long and weighing half a ton is used. The method used and the type and introduction of the reinforcement is similar to that used for the driven pile, except that the sectional tube will be jacked out in sections. In both these methods the pile may be finished at any depth below ground, at ground level or any convenient height above ground.

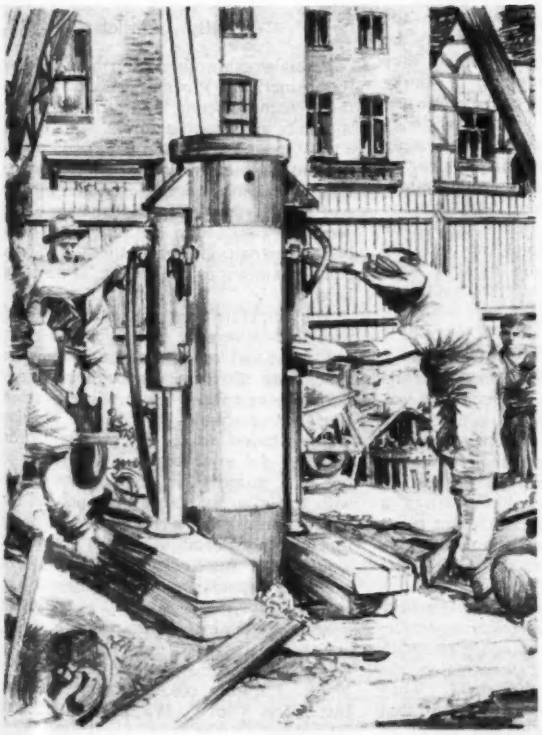
Used by Area Boards

The chief use of the third method of pile driving, where short lengths of piles of square cross section about 30 in. long called 'miga' piles are employed, is for the strengthening of foundations or underpinning buildings.

Frankipiles have been used by many of the area boards through the country for a variety of piling projects.

These include the construction of the base of a spirally guided gas holder 114 ft. 6 in. in diameter, retort house and coal and coke grading plant foundations, and the foundations for a sulphate of ammonia store large enough to hold 10,000 tons of salt.

The chief advantages to be gained from these systems of piling would seem to be adequate strength with the minimum weight of material, the minimum disturbance to other structures or foundations in the neighbourhood, large toe bearing area by the formation of the bulbous foot and easy bonding in to subsequent construction. The speed with which driving can be carried out is surprisingly high when the number of operations to be undertaken is considered.



The sequence of operation in bored in situ pile driving:—

Extreme left: *The coring tool entering a hollow cylindrical section in the preliminary boring.*

Centre: *Placing the cage of reinforcement into the boring after the completion of the base.*

Right: *Jacking out successive cylindrical sections, while concreting the pile.*

Revised British Standard for Iron Pressure Pipes

THE revised publication, 'British Standard for Centrifugally Cast (Spun) Iron Pressure Pipes for Water, Gas, and Sewage' (B.S. 1211:1958), is one of a series of British Standards for cast iron pipes. It deals with centrifugally cast (spun) iron pressure pipes for water, gas and sewage, manufactured in either metal or sand moulds. The general section specifies requirements for the quality of metal, quality control, selection of test pieces by the purchaser, hydraulic tests, coating, and permissible deviations in weight.

Sections 2 and 3 of the Standard deal respectively with pipes cast in metal moulds and in sand moulds; they deal principally with mechanical tests and with marking requirements.

Throughout this publication the appropriate portions of the ISO Recommendation on cast iron pipes, special castings and cast iron parts for pressure main lines have been taken into account. Copies of this British Standard can be obtained from the British Standards Institution, 2, Park Street, London, W.1. Price, 6s.

Pipeline Industries Guild First Annual Dinner

Chairman Speaks of the 'Unique Occasion'

THE first annual dinner of the Pipeline Industries Guild was held in London, on March 11. Mr. J. W. Jones, of Constructors—John Brown, Ltd., presided.

Among members and guests were Mr. Martin T. Flett, C.B., (Deputy Secretary, Ministry of Power); Mr. T. Mervyn Jones (Chairman, Wales Gas Board); Sir Stanley Rawson (Chairman, Constructors, John Brown, Ltd.); Mr. S. W. Kaye (Director, Stewarts & Lloyds, Ltd.); Mr. G. McHardy (Metrotect, Ltd.); Mr. H. R. Lupton, O.B.E. (Consultant); Mr. C. C. Bates and Mr. G. A. K. Stobie (Welding Supervision, Ltd.); Mr. S. J. Manning (Iraq Petroleum Co., Ltd.); Captain J. W. Namonde, O.B.E., and Dr. J. S. Blair (Stewarts & Lloyds, Ltd.); Mrs. M. E. Shields (General Secretary of the Guild); Mr. H. G. B. Nolan and Mr. D. J. Green (Shell-Mex and B.P., Ltd.); Mr. T. W. Jones (Editor, *Fluid Handling*); Mr. E. J. Sturgess, C.B.E., (Shell Petroleum Co., Ltd.); Mr. K. A. Spencer (Spencer & Partners); Mr. D. S. Tulloch (Cathodic Corrosion Control, Ltd.); Mr. J. H. Morgan (Vickers Group Research Establishment); and Mr. J. J. Maye (Constructors-John Brown, Ltd.).

Mr. Martin T. Flett, C.B., who proposed the toast of the Guild, said he deemed it a great honour to have been invited to cut the cake at this first birthday party of so handsome and thriving an infant.

A First Fundamental

He believed the pipe was one of the fundamentals which distinguished man from the beast, and the man who had first hollowed out a tree trunk to carry water deserved as much gratitude from humanity as his fellows who discovered or invented the wheel. Nowadays there was practically nothing that could not be carried efficiently, economically, and expeditiously through a pipe, from the radioactive isotope to the passenger in the tube train.

The industries for which his Department had responsibility both produced and consumed pipes on an enormous and ever-increasing scale. The Ministry of Power was proud to be associated, as it had been for the last year, with the steel industry, and he paid particular tribute to that industry, which had doubled, if not trebled, their production of pipes in the last ten years.

Oil pipelines today had become what railways were a century ago, and such great names as Tapline, Trans-Canada and Trapile would rightly become as well known to this generation as were the Canadian-Pacific and the Orient Express to our grandfathers. The pipeline constructor was the real frontiersman of our time.

More exciting, in a way, because it was such a new development, was the prospect of carrying coal by pipeline. His Ministry was co-operating with the National Coal Board in a series of experiments on the hydraulic transport of coal, which had already produced a working lane at Markham Colliery carrying 3 in. lumps of coal a distance of some 300 yards. It would solve a lot of problems if we could add that new weapon to our armoury.

Speaking of gas, he said that in the presence of Mr. Mervyn Jones and Sir Stanley Rawson he would not attempt to cover again the ground that was covered much better by the Duke of Edinburgh when he had opened the North Wales gas grid last winter. Pipelines for gas opened up the exciting prospect of a national gas grid, which might not be so far away as some people thought; and perhaps, who knows, a permanent successor to PLUTO in the form of a trans-oceanic pipeline bringing to these shores the natural gas of the Middle East or the Western hemisphere.

Learned Society

It was very evident from the Guild's constitution, he concluded, that the Guild intended to become a learned society. That by itself entitled its members to the gratitude and good wishes of their fellow countrymen, because the world had never stood in such need of serious, honest and constructive thinking as it did today.

They would not under-estimate the difficulties of earning for their society the place in men's esteem to which they rightly aspired. In the world of knowledge and ideas, prestige could be earned only by years of hard work, consistency and, above all, a reputation for pursuing only the best and never, under any circumstances, succumbing to the temptation to tolerate something less than the best. They had in their hands the opportunity of developing an industry and a science that could make a very material contribution to the happiness and health of mankind.

Gathering Momentum

The Chairman, in responding, said the occasion was unique, in as much as it was the first time in this country that there had been a gathering of pipeliners at a dinner specifically organised for pipeliners. Starting the Pipeline Industries Guild had been rather like starting a pipeline spread, for once it had got going it very rapidly gathered momentum; he was happy to say that the Guild was gathering momentum.

Pipeliners were, without doubt, a very distinct branch of the engineering fraternity. They seemed to be consumed with an insatiable desire for working in the most remote parts of the world. They all had one very consistent urge, and that was to get the job finished ahead of schedule; it was rarely that that object was not achieved. That result was achieved by a lot of hard work in unpleasant conditions, and mainly it was the result of a very fine spirit of comradeship.

In this country, modern pipelining was a comparatively new industry, and until recently it was the virtual monopoly of our American friends. It was they who had developed the laying techniques and the equipment with which it had been possible to lay long distance pipelines over any type of country at high speed, and it had been from their know-how that we had made rapid progress during the post-war years. We had been very apt pupils, with the result that we had in this country an ever-growing number of people who had gained a wide knowledge of the art of pipelining. A little over a year ago a handful of those pipeliners considered it would stimulate interest if an organisation could be formed whereby all those connected with the pipeline world could be brought together for the purposes of exchanging ideas, discussing developments, and generally keeping in touch.

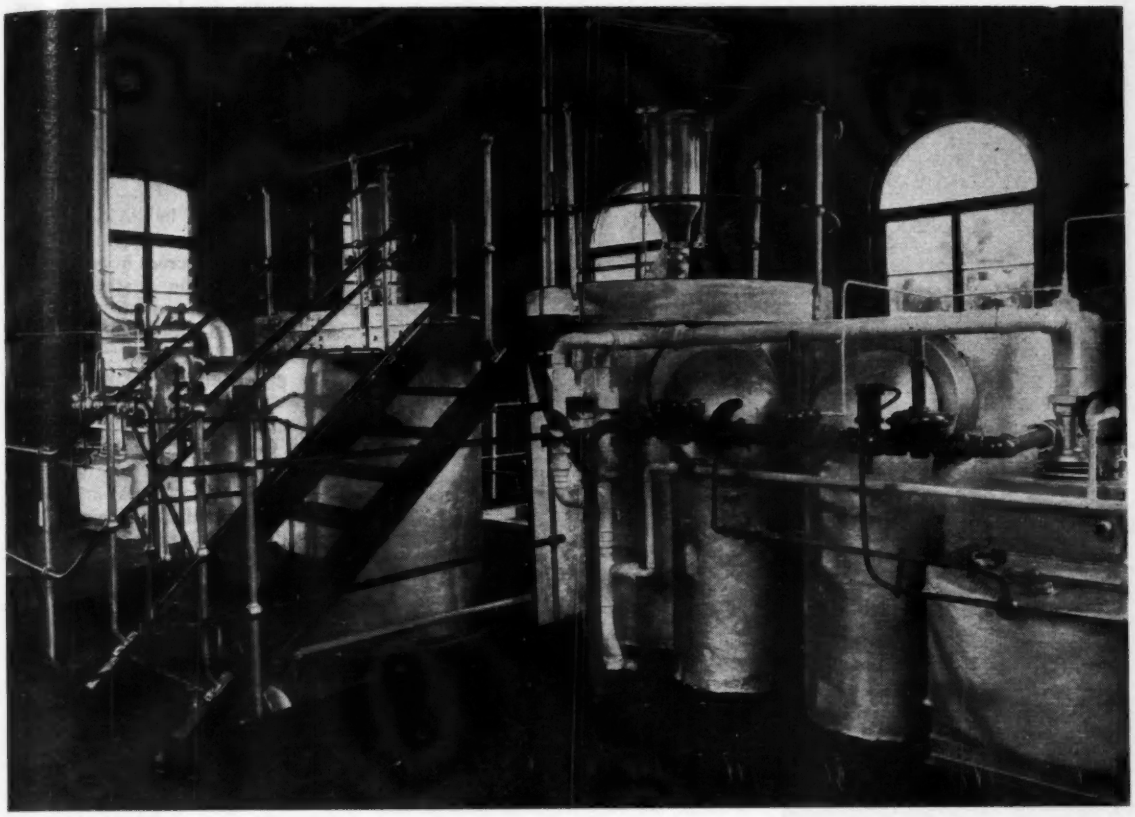
The result was the formation of the Guild, which had gained immediate support from pipeline owners, designers, suppliers of materials and equipment, and contractors. Support was given in a most generous manner.

Equally Ambitious

It was worth noting the tribute paid by the American Pipeline Association, at their recent meeting in Florida, to their suppliers and manufacturers, who played a very great part in the continued development of their very successful pipeline industry. From small beginnings they had built their organisation into the accepted controlling authority on pipeline construction; and the Guild was equally ambitious to do the same thing here.

The pipeline was mostly associated with the conveyance of liquids and gases, but great strides were being made in developing the pipeline for the transportation of solids. He predicted that in England we should have to use pipeline transportation to a far greater extent than we did now for the conveyance of our bulk products, in order to keep pace with the ever increasing demand. If the Guild could play a part in developing pipeline transportation in this country it would have fulfilled a need; and if the evening's attendance was a guide to the possibilities of its future, it could be modestly confident of that future.

Captain J. W. Esmonde, O.B.E., proposed the toast to the guests, while Mr. H. R. Lupton, O.B.E. (Past President, Institution of Water Engineers), responded.



Catalytic Desulphurising Plant at Jersey

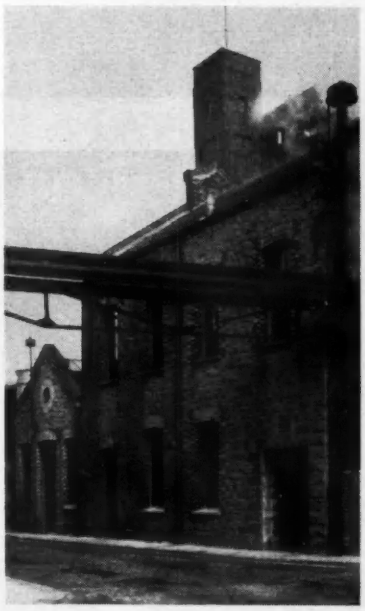
A HOLMES-MAXTED catalytic sulphur removal plant installed at Jersey last year has reduced the total sulphur in the gas distributed from the St. Helier works to 5 grains per 100 cu.ft.

This represents a considerable step forward towards the better use of town gas for space heating; not only is the corrosion of water heaters and central heating boilers diminished but also the use of gas in flueless appliances is made possible. Portable gas fires can be used where formerly only electric fires could be used with any degree of comfort and gas convectors can compare very favourably with their electric counterpart in thermal efficiency. The many advantages claimed for portable oil fired convectors are nullified by the greater heating capacity and ease of fuel supply enjoyed by the convector fired by low sulphur content gas.

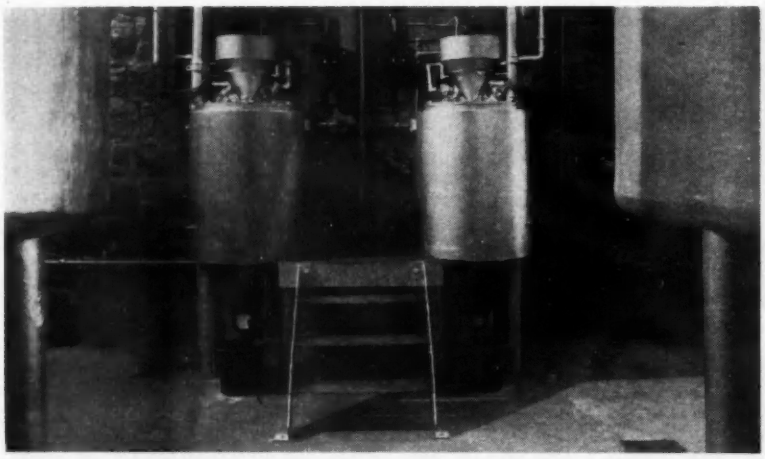
The supply of gas in Jersey has a long history. The first gasworks was built in 1850 and the founders of the present Company, the Jersey Gas Light Co., Ltd., bought the undertaking in 1856. From that time, except for the occupation, they have enjoyed continual expansion.

A new 3.141 mill. cu.ft. a day carbonising plant was built four years ago after much time had been lost by shortage of materials. The Company was determined to be able to compete on an equal footing with other available fuels and in this way to make real the contention that gas is indeed the most efficient way of using our indigenous fossil fuels (for all coal for this works comes from Yorkshire). The undertaking is still in private hands and therefore has to be in a position to stand on its own feet. The electricity supply company is similarly constituted, and there is no physical connection between the two, since all electric power at the gasworks is generated from waste heat and none is exported.

The Holmes-Maxted plant for catalytic sulphur removal installed at Jersey is capable of processing up to 4 mill. cu.ft. per day of what would normally pass for town gas with an organic sulphur content of about 35 grains per 100 cu.ft., free from hydrogen sulphide. After passing through



Top of page: *View from top platform of catalyst vessel, preheater and gas furnace.* **Above:** *The old C.W.G. building, housing the new plant.*



Above: *A view of the catalyst regenerator plant showing the duplicate units and the electrical control gear on the wall behind.*

Left: *The base of the catalyst vessels seen at floor level. The blower fans can be seen for circulating the flue gases through the preheater units and in the foreground is the 'Electroflo' controller for temperature regulation.*

Below: *General view at floor level showing the heat exchangers and the catalyst unit on the extreme left.*

the catalytic desulphurising plant the greater part of the organic sulphur has been converted to hydrogen sulphide and the gas, containing about 22 grains of H_2S and about 5 grains of organic sulphur per 100 cu.ft., is purified of the hydrogen sulphide in iron oxide catch boxees in the normal way.

The plant may be divided up into three main parts—the preheating of the gas before it comes in contact with the catalyst, the catalyst vessel followed by the cooling of the processed gas, and the catalyst regeneration plant.

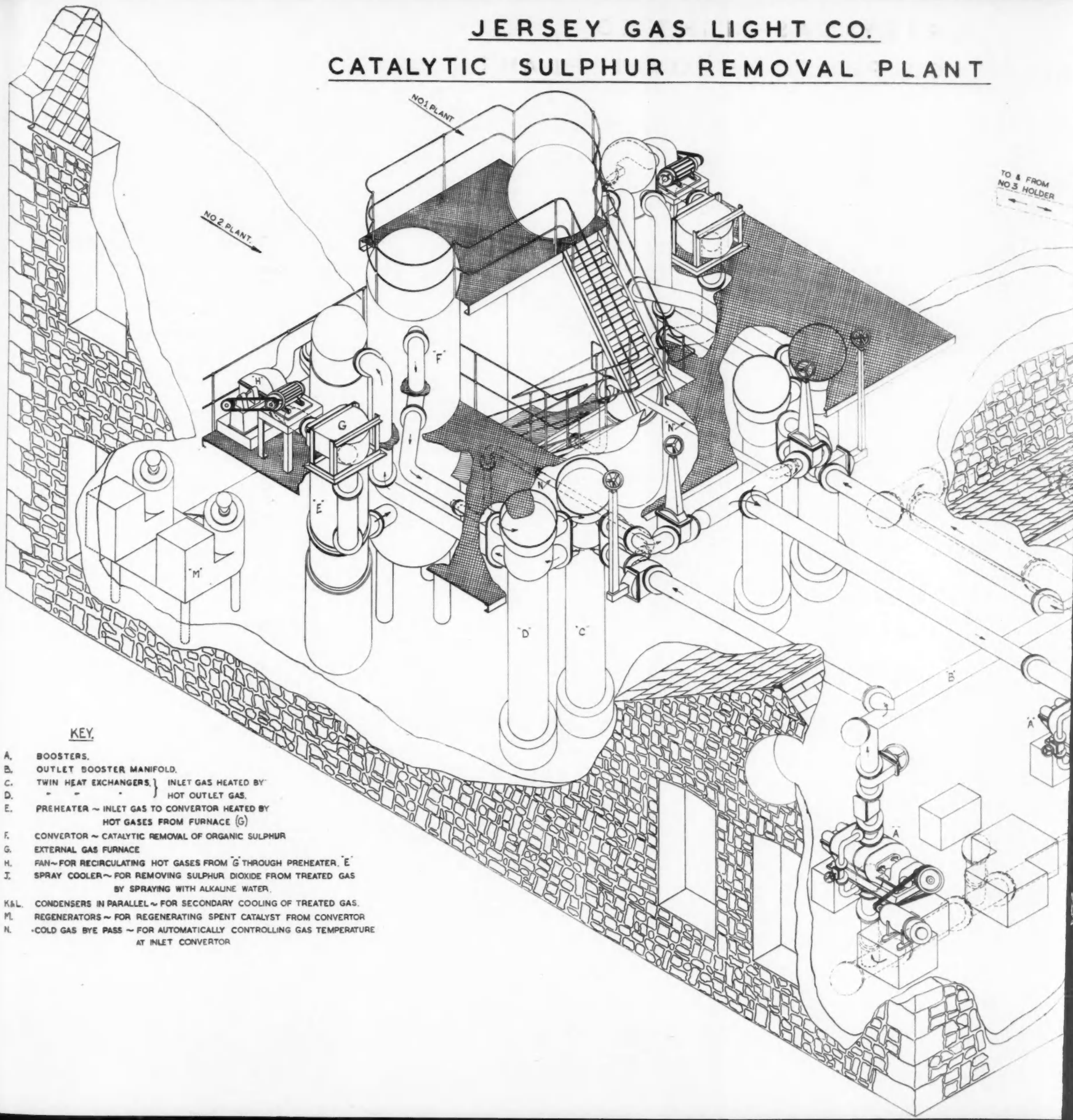
The gas from the purifiers divides into two streams and is fed into two electrically driven 12 in. by 30 in. Holmes-Connersville boosters which pass the gas forward into two independent catalytic plants in parallel. Space has been left for a third booster as stand-by to the other two. The gas enters two heat exchangers in series whereby its temperature is raised to 260°C. by the hot gases coming away from the catalyst vessel.

Constant Temperature Essential

The temperature of the gas is raised to the reaction temperature of 360° ± 3°C. in a third heat exchanger by hot flue gases from a furnace by the combustion of desulphurised town gas in a specially designed inspirator burner, whereby the amount of gas for combustion is controlled by the volume of air entering the burner. This air is supplied by a centrifugal blower, normally at 28 in. W.G. The pressure in the heater is kept at a predetermined value and any excess of flue gas passes to atmosphere. The gas passes to the catalyst vessel in which are placed three thermocouples (connected in series) at a depth of 2 in. inside the first catalyst pass—it is assumed that the catalyst will be hottest here because any reaction between oxygen and hydrogen contained in the gas will have taken place at this point. In fact, to make sure of proper temperature control, the proportion of oxygen in the gas must not rise above .8%. The temperature measured by these thermocouples is recorded on a chart, and the recorder mechanism actuates an Electroflo regulator which is mechanically linked to two valves on two pipe lines. Of these valves, one controls the air supply to the gas burner and so the gas for combustion, and the other, which is placed in the gas by-pass round the heat exchangers enables cold gas to enter the catalyst vessel to reduce the reaction temperature. The gas furnaces are protected by 'Protectoglo' devices which will shut down the plant in case of flame failure. This will also happen

JERSEY GAS LIGHT CO.

CATALYTIC SULPHUR REMOVAL PLANT

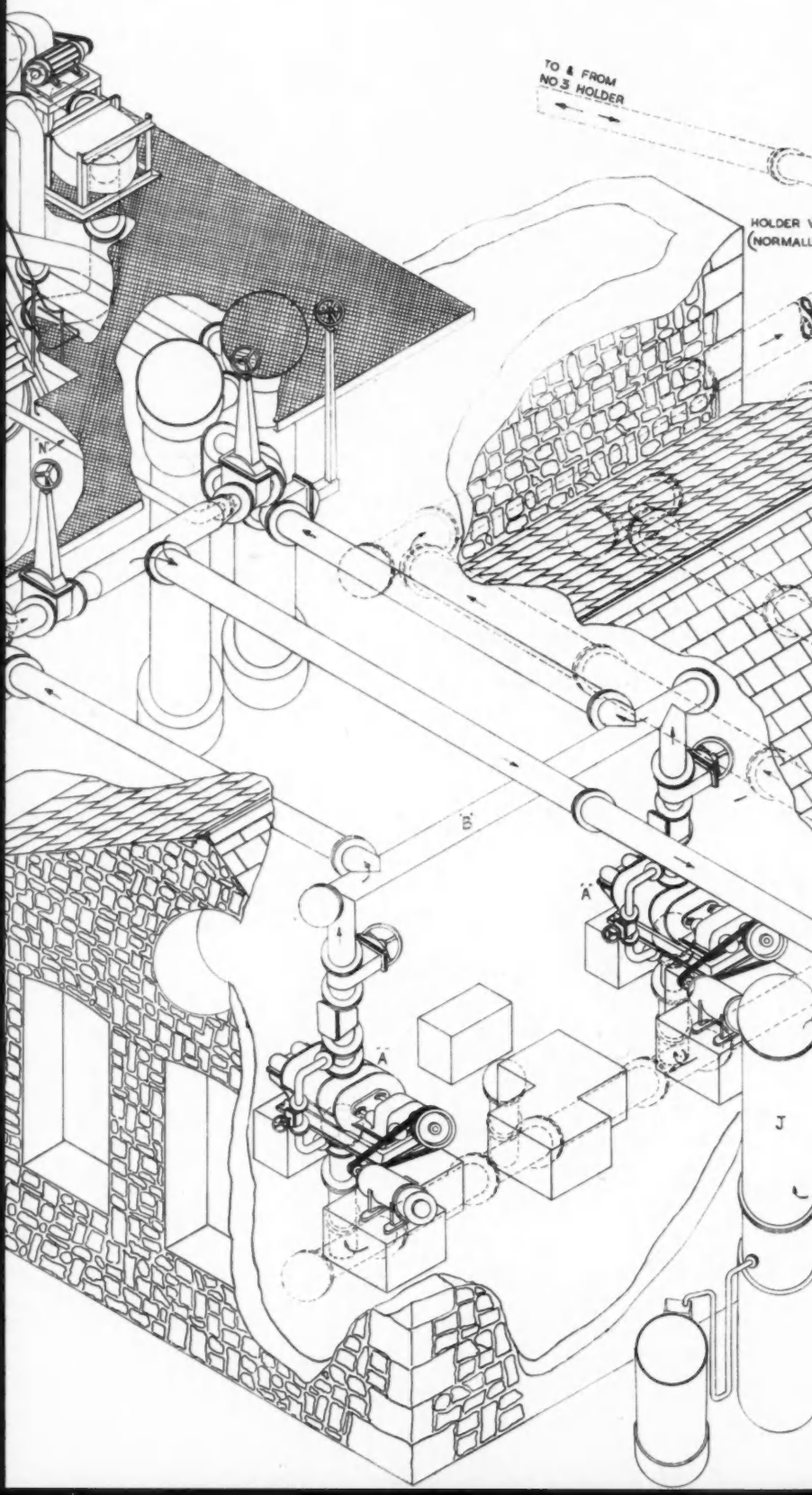


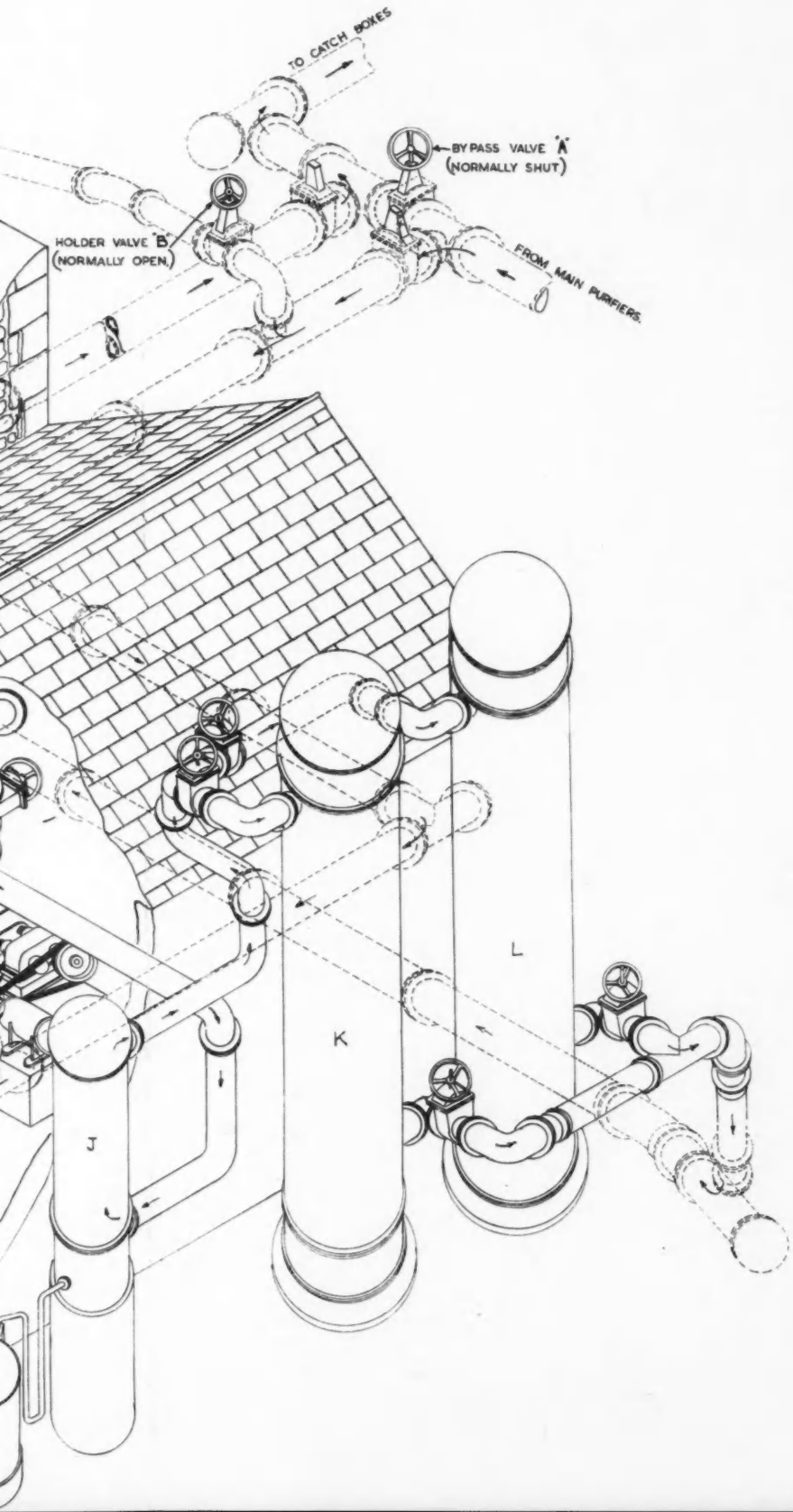
KEY.

- A. BOOSTERS.
- B. OUTLET BOOSTER MANIFOLD.
- C. TWIN HEAT EXCHANGERS. } INLET GAS HEATED BY
- D. " " " } HOT OUTLET GAS.
- E. PREHEATER ~ INLET GAS TO CONVERTOR HEATED BY HOT GASES FROM FURNACE (G)
- F. CONVERTOR ~ CATALYTIC REMOVAL OF ORGANIC SULPHUR
- G. EXTERNAL GAS FURNACE
- H. FAN ~ FOR RECIRCULATING HOT GASES FROM 'G' THROUGH PREHEATER, 'E'
- J. SPRAY COOLER ~ FOR REMOVING SULPHUR DIOXIDE FROM TREATED GAS BY SPRAYING WITH ALKALINE WATER.
- K&L. CONDENSERS IN PARALLEL ~ FOR SECONDARY COOLING OF TREATED GAS.
- M. REGENERATORS ~ FOR REGENERATING SPENT CATALYST FROM CONVERTOR
- N. COLD GAS BYE PASS ~ FOR AUTOMATICALLY CONTROLLING GAS TEMPERATURE AT INLET CONVERTOR

AS LIGHT CO.

R REMOVAL PLANT




TO CATCH BOXES
BY PASS VALVE 'A'
(NORMALLY SHUT)
HOLDER VALVE 'B'
(NORMALLY OPEN)
FROM MAIN PURIFIERS
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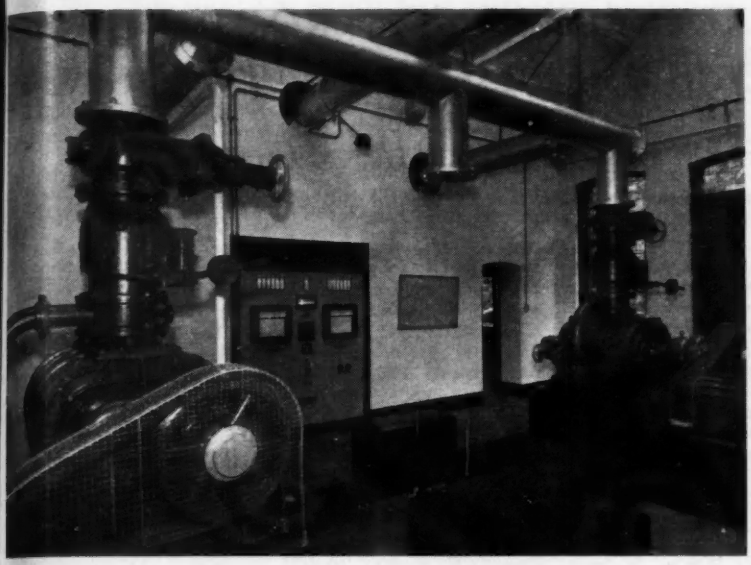


The interior of the booster house adjoining the main building. The two electrically driven Holmes-Connersville boosters are seen with provision for a third. In the background is the instrument panel.

if the temperature of the catalyst rises above the predetermined temperature and it becomes impossible for the temperature regulating devices to reduce it. Should the plant be shut down, gas from the main purifiers entering the catalyst plant will be passed to a relief holder, visual warnings will appear on the control panel in the booster room and a klaxon will warn the shift foreman.

The Catalyst Vessel

The Maxted catalyst is fed into the catalyst vessel at the rate of 1 cu.ft. for every 1 mill. cu.ft. of gas treated by the plant. Fouled catalyst is withdrawn and stored in a small hopper at the base of the catalyst vessel which is emptied twice a day. To accomplish this without shutting down the plant a gas interlock has been designed and fitted. To cool the gas after passing through the catalyst vessel, it is passed through the two primary heat exchangers in series, a spray cooling tower, common to both plants, and finally through existing condensers to remove any excess of water. From here the gas goes to the oxide purifier catch boxes for the final absorption of the hydrogen sulphide formed in the catalytic vessel.

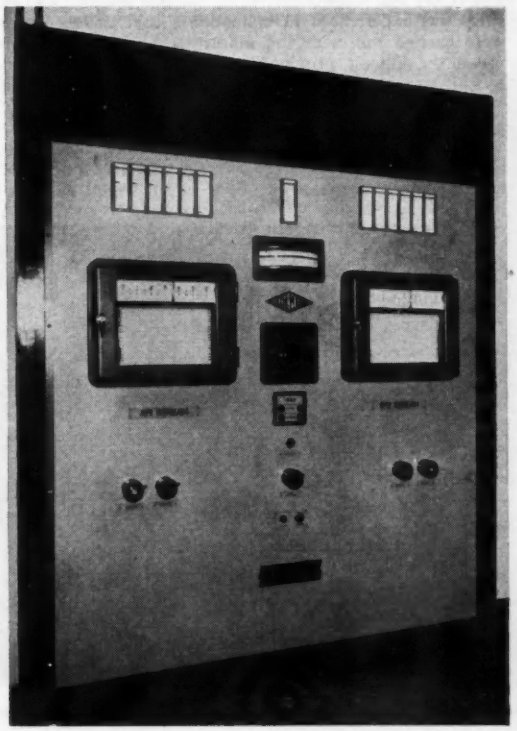
The catalyst vessel is a double pass unit in which the catalyst is placed in an annular bed between cast iron louvred ring sections forming a central vertical gas way. The gas enters an annular gas way at the bottom of the vessel and passes through a 12-in. bed of catalyst, which also acts as a distributor, on its way to the central gas way. From here it passes out through a second 12-in. layer of catalyst into the outer annular gas way, which is completely sealed from the bottom section of the vessel. Finally, the gas passes out at the top on its way to the heat exchangers.

During the reaction the catalyst becomes covered by a carbon deposit caused by the hydrogenation of the carbon disulphide present in the gas before desulphurising, and is eventually rendered ineffective. To regenerate the catalyst, calculated amounts are withdrawn from the base of the vessel (which is recharged at a corresponding rate) and transferred to the regenerator plant in which the carbon is burned off under strictly controlled conditions.

Limited Oxygen Necessary

In this plant flue gases from an inspirator type of gas burner, containing 5% of oxygen, are passed through the catalyst. The oxygen will react with the carbon deposited on the fouled catalyst to leave a clean regenerated product which can be used again. It is most important that the proportion of oxygen in the flue gases should not rise above 5% since this would raise the temperature of the catalyst to a point at which it would become unsuitable for further use. Should the temperature in the regenerator begin to rise towards the critical point of 600°C. more gas can be fed to the burner to reduce the proportion of oxygen in the flue gases and so reduce the temperature. This is under manual control. The regenerator plant is duplicated to allow continuous running if needed.

Adequate instrumentation has been provided and is centralised on a panel in the booster house. The plant has been installed in an old water gas plant building, constructed of local stone.



A close-up view of the instrument panel, on which pressures and temperatures from both desulphurising streams are measured. Pressure indicators are seen above the two Electroflo temperature recorders, while warning lamps to show excessive temperatures in the catalyst vessel, etc., are seen in the bottom row.

ELIMINATING UNNECESSARY RODDING ON CONTINUOUS VERTICAL RETORTS

By S. K. HAWTHORN, M.I.C.E., M.Inst.Gas E.,

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IT has always been accepted that continuous vertical retorts require rodding at regular and fairly frequent intervals to maintain uniform travel of coal. Any slowing up or halting of coal movement is known to cause an increase in the temperature of the gas passing through the retort offtake. As long ago as 1927 an attempt was made at the Nechells works of the City of Birmingham Gas Department to use this fact to operate a device which would give warning of increasing gas offtake temperature and consequently indicate the need for rodding. It was thought that the successful development of this idea could lead to the elimination of a great deal of wasted manual effort in rodding retorts. The early experiments were unsuccessful, but in 1950 wider investigations into variations in retort gas offtake temperature were carried out by the Birmingham Division of the West Midlands Gas Board. At each works the gas offtake temperature of selected retorts was recorded by a thermograph with the mercury in steel thermometer fitted into the offtake rodding hole and the retorts were rodded only when absolutely necessary to maintain coal travel. Upward, downward and lambent heated retorts with major axis varying between 62 in. and 103 in. were included in these experiments which soon indicated that hourly rodding was unnecessary.

At the central test works a single retort similarly fitted with a thermograph was made available to investigate offtake temperature conditions and retort travel with many of the coals then being received into the Birmingham Division. Here it was found that, although there were marked variations in average offtake temperatures for different coals and varying throughputs, a temperature in the region of 250 to 270°C. with any coal indicated that the retort required rodding. An alarm was therefore installed and set to operate when the thermograph recording mechanism indicated a temperature of 250°C. The retort was rodded only when the bell sounded and no difficulty was experienced in maintaining coal travel. Later tests were carried out with the alarm set at 270°C. and rodding was never difficult, proving that the alarm temperature was not too high even for coals giving a low average offtake temperature. Having proved the principle with individual retorts, it was decided to extend the scope of the experiments. It was apparent that to obtain the full benefit from such an installation, the offtake temperature of each retort should be recorded and this could most easily be done by the use of thermocouples and a multi-point recorder. Accordingly, a trial was carried out at the Windsor Street works on six 62-in. upwardly heated retorts with thermocouples fitted in various positions in the offtake castings. The multi-point recorder was so modified that a red warning light showed for a retort offtake temperature between 270 and 300°C. and a green light for a temperature between 240 and 270°C. Each retort in turn was in circuit with the recorder for 35 seconds and its number was indicated on the selector switch. During that time if the temperature lay between 240 and 300°C. the appropriate light was obtained and retorts were only rodded when a red light showed. With this experimental installation no warning was given of temperatures above 300°C. or below 240°C. Various refinements now suggested themselves, the most important being that a separate warning light was essential for each retort to avoid having to watch the recorder continuously. It was also decided that audible notice of a red light showing would be helpful, but only one audible alarm would be required for a whole retort house.

The trials having proved that there was much to be gained by the use of such an installation, it remained only to find the most suitable position for the thermocouple so that it would give a correct reading of the temperature of the gas leaving the retort without interfering with rodding. After many positions had been tried, it was found that these conditions could best be met by fitting the thermocouple through the back of the hopper end casting in the position shown in Figs. 1 and 2. The complete installation having been proved practicable, it was decided to incorporate rodding alarms on two new retort benches each of 24 Woodall-Duckham 82 in. lambent heated retorts then being constructed at the Windsor Street works. The hopper end castings were ordered with suitably drilled bosses to receive the thermocouples which, with their wiring, are neatly concealed beneath the floor plates. The couples themselves are iron-constantan in 14% chromium iron sheaths and their leads, secured to the setting stanchions above floor level, are taken to temperature recorders through centrally located switch boxes containing separately numbered switches for each retort. These switches disconnect individual thermocouples from the recorder when a retort is not at work, *e.g.*, during scurfing times.

The recorder installation comprises four separate units, each complete in itself and serving 12 retorts, together with a

Fig. 1. View inside retort showing position of thermocouples.

Fig. 2. Showing thermocouple position in hopper and casting.

common audible alarm. The recorders are of the 12 point potentiometer type manufactured by Integra Leeds & Northrup Ltd., each, together with its appropriate 12 warning lights, forming part of the main setting control panel situated in an instrument room at top of retort level; the panel is readily visible through a large window. A counter to indicate the number of alarms is provided above each instrument. The alarms are operated by micro switches actuated by cams on the instrument slidewire spindle. The micro switches are in circuit with relays which in turn operate the audible alarm and the separate warning lights. The maximum allowable temperature can be varied only from inside the instrument by rotating the cams on the slidewire spindle. Fig. 3 shows one of the instruments together with its warning lights and counter, while Fig. 4 shows the complete control panel as seen from the rodding stage. The recorder gives a reading every minute, and thus the offtake gas temperature of each retort is recorded every 12 minutes. The actual recording is a dot on the instrument chart with a number alongside it, and should the allowable temperature, at present 250°C., be exceeded, the audible alarm sounds, the appropriate retort warning light comes on, and the counter moves forward one. While the audible alarm sounds for approximately three seconds only, the red warning light remains on for 12 minutes, *i.e.*, until that particular retort is again in circuit with the recorder. Should the temperature still be in excess of the maximum allowable, the audible alarm sounds again, the red warning light remains on, and the counter records a further alarm. If during the 12 minute interval rodding has restored the coal travel to normal and the gas temperature has fallen below 250°C., the red warning light goes out.

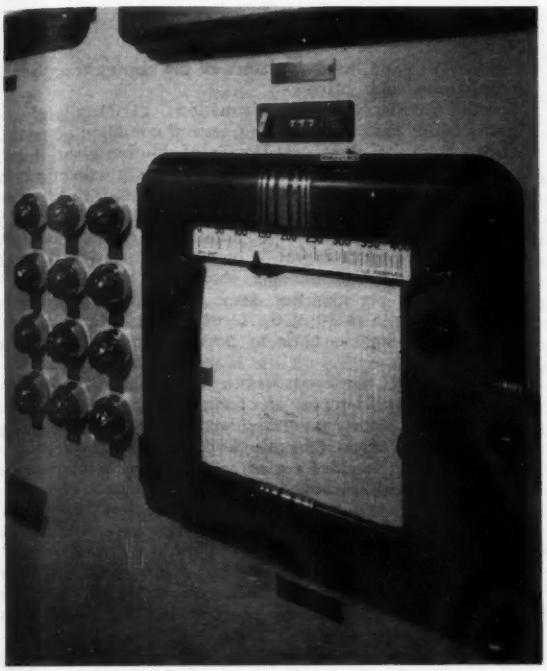

Fig. 3. Multi-point recorder with corresponding warning lights and counter.

This equipment has been at work for approximately ten months. In the early stages some difficulty was experienced in maintaining uniform coal travel, but over a period of six months alarms averaged only 40 per shift, *i.e.*, less than one per retort per shift. On one isolated shift of abnormally bad coal travel there were 276 alarms equivalent to between five and six per retort. Following a modification to the coal deflector plates, coal travel was improved and over the last four months alarms have occurred only about 12 times per shift, which means that on average each retort has been rodded only once every 30 hours. This is very different from the conventional hourly rodding formerly allowed for in stokers' working stints. There is little doubt that the installation of these alarms has eliminated unnecessary rodding, and two top men can comfortably look after 48 retorts, including in their duties platform sweeping, oiling coal valves, offtake augering and tar bosh cleaning.

The recorder gives a very sensitive record of the offtake gas temperature of each retort and should the travel of coal down the retort be interrupted in any way, *e.g.*, by the extractor drive stopping or the driving wedge slipping on an individual retort, an early warning is given and immediate steps can be taken to rectify the fault. It has proved a great advantage to have early warning of a retort 'going sick' and to apply the remedy of prompt rodding instead of discovering at a routine visit that 'the sickness' is in an advanced stage and the retort is 'lost.' The cost of this first full-scale installation of recorders and alarms for 48 retorts was about £2,900.

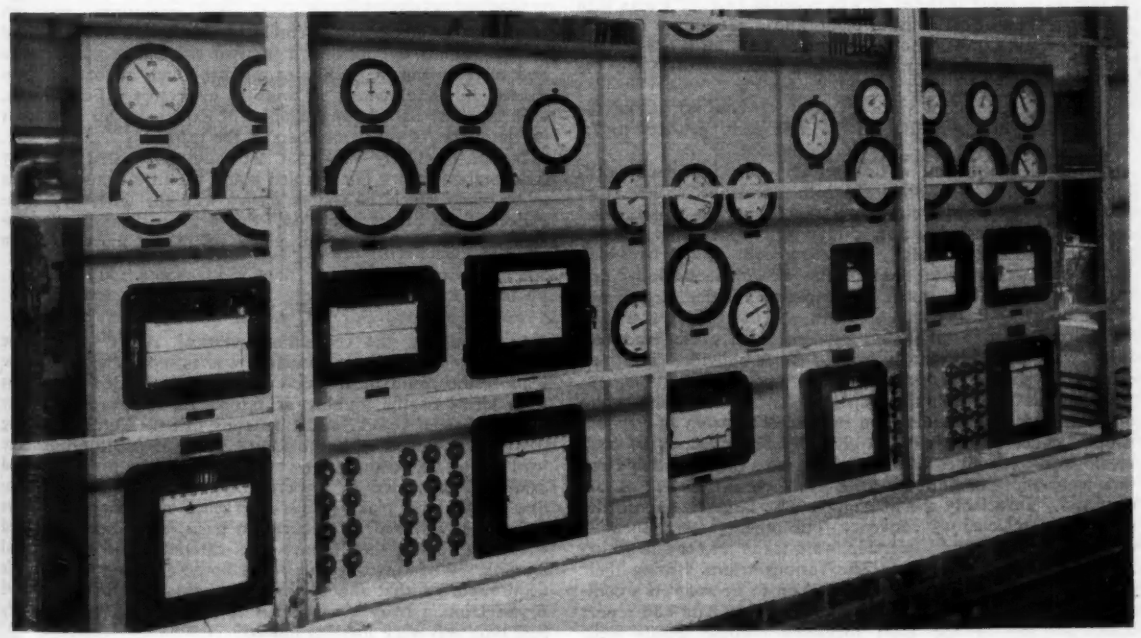

Fig. 4. General view of control panel from rodding stage.

From a paper to the North of England Section of the I.G.E., March 6, 1958.

Introspection by Technical Audit

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TOWARDS the latter part of 1953, at the instigation of the Chairman of the Northern Gas Board, the Committee of Divisional General Managers was set the task of introducing a system of auditing on a technical basis. In choosing a system of technical auditing for use in the Board's area, the Committee was very conscious that the traditional attitude of mind to auditing was the most difficult obstacle to overcome in applying any system, whether operated by an external body or internal personnel. They contended that the first essential of any scheme should be that it should receive the full and willing support of all concerned.

They therefore decided in favour of an internal system devised by themselves, since this system utilised the services of the more technically qualified personnel in the Board's area and made use of their accumulated knowledge and experience to the benefit of both the Board and their fellow engineers.

The Committee's first aim was to obtain an improvement in overall efficiency of the production units and it was considered advisable to tackle this in stages by concentrating on one major portion of each works plant.

Higher Standard

The Committee were determined to formulate a constructive system of auditing, and to achieve this it was recommended that auditing personnel should concentrate on looking for methods of good practice found in one works as against another of like type. By also noting points conducive to greater efficiency it was hoped to create a higher standard which all would ultimately strive to reach. Operation of such a system on a fully co-operative basis should attain better results than the general negative reaction expected from a wholly critical report submitted by an outside body.

In employing a system which used comparison of like types as one of its main features, it was essential that all works with the same class of carbonising plant, and a productive capacity within certain limits, should be segregated into one group. To cover all works it was therefore necessary to form the following series of groups:—

Group A, continuous vertical retorts, covered six works, the capacity of which varied from 0.4 mill. cu.ft. per day to 7.4 mill. cu.ft. per day.

Group B, intermittent vertical retorts—only four such works in the Board's area, and, although capacities varied from .5 mill. cu.ft. per day to 8 mill. cu.ft. per day, individual chamber capacities were not so divergent, apart from one old plant of Dessau verticals.

Group C, horizontal retorts (large works), included six works of which the maximum capacity of the largest was about 7 mill. cu.ft. per day.

Group D, horizontal retorts (medium sized works—mechanised), was so large that it had to be sub-divided into two sections of six works, and five works respectively.

It was arranged that the inspection or audit of each group of works should be undertaken by a separate team of auditors with a leader or convenor in charge. The manager of each of the works contained in the group formed the team and from this team the Committee selected one person to act as the convenor. Invariably the manager of the largest works in the group was selected as convenor, but other factors, such as overall experience and leadership, were taken into consideration in making the final choice. The various teams visiting their respective group of works were called on to operate on a common basis and so the Committee framed works data and report sheets for use of the team members. These sheets were divided into Part A and Part B. Part A was to be completed for each works and be in the hands of the visiting team before the inspection took place.

It called for the following information: (1) Details of carbonising plant; type, age, size and general condition of retorts. (2) Load factor of plant. (3) Details of dilution plant, if any. (4) Details of governor control and pressure conditions in hydraulic main, etc. (5) Details of coals used with appropriate analyses. (6) Calorific values, declared and actual. (7) Thermal yields. (8) Information relative to gas analyses. (9) Coke and breeze yields expressed on a saleable basis. (10) Full details of retort house manning, shown for comparative purposes as therms per man per day. Information given under sub-sections Nos. 5 to 10 of the form were to refer to a four-week period ending as close as possible to the date of the proposed visit.

Section "B" of the report was to be completed by the visiting team who would report on conditions found on the plant, covering such items as general condition of retorts (including working history), retort fitments, producers and working tools, etc. Lost therms in the form of coke rejected in clinker was a point for special investigation and other matters of importance were lighting, cleanliness and safety. Here the visitors' first impressions can spot anomalies which have come to be accepted by the local personnel.

It was the responsibility of each divisional general manager to brief any team convenors in his division, but thereafter the responsibility for the audit of the individual groups of works was entirely on the shoulders of the convenors and team concerned. The convenor was further responsible for gathering his group together and collectively making all arrangements for visiting the works concerned within a reasonable space of time.

In general, works managers welcomed the visit of the auditing teams. This reaction, to what is generally taken to be a critical examination of one's own operations, was certainly due to the feeling of confidence the Board had implanted in their minds by utilising their own colleagues as examiners and so removing the feeling of distrust which might have been caused by employment of outside inspectors. Furthermore, each manager had the opportunity of expressing his own views on the works of other members of the team.

It can be safely said that the audits revealed no really fundamental faults, but enabled many useful recommendations to be made which, of course, varied with the different classification of the plants inspected. For a more detailed examination of the findings, each group of plants must be taken separately.

Divergence of Viewpoint

In Group A, the continuous vertical retort group, the question of the various standards was raised under which the load factor could be assessed, and it was decided to express it in terms of the number of retorts gas-making divided by the number of retorts under gaseous firing. Retorts scurfing were not included as gas-making. In most other groups the load factor was taken as the actual production for the period examined expressed as a percentage of the maximum production for the plant. This divergence of viewpoint shows that there was need for a common basis in the standard used which, of course, should have been catered for in the original briefing. When investigating retort house governor control this team reported that the improvement obtained in the use of Bryan Donkin relay governor as compared with the ordinary bell type was very marked indeed.

The coals carbonised in the six plants were either run

of mine (50 to 60% under ½ in.), or washed singles or doubles (10 to 15% under ½ in.). With the two plants carbonising primarily the former class of coal, which had a highly fusible ash and day to day variations in the swelling index and coal size, difficulty was noted in the maintenance of accurate continous control of carbonising rate with its consequent lowering of thermal yield. Thermal yields for the six works are compared in Table 1. Since the calorific values are not on the same level for all the works, the correlated 'steaming curve' figures have been inserted for what they are worth.

Table 1.

Cal. Val.	A	B	C	D	E	F
450 ...	*86.6*	87.3	96.0	81.7	100.0	*80.7*
475 ...	79.0	79.9	86.0	*74.0*	90.0	73.0
500 ...	73.0	74.0	*79.7*	68.0	*83.0*	67.2
% Volatile matter	33.9	33.9	33.9	29.5	33.0	29.3

The figures in italics show the thermal yields obtained at the operative calorific value. The team also noted that the coke and breeze yields appear to be related to the fixed carbon and ash content of the coals carbonised and where unscreened coals were being used the largest sized coke was produced. This latter fact was also associated with the two works carbonising coals of low volatile content. The two works mentioned, namely D and F, gave the highest combined coke and breeze yields. The C.V.R. team contended that the therms per man per day were not strictly comparable owing to the varying local agreements regulating the manning of plants. The writer, however, is of the opinion that such factors as manning, often as the result of long standing conditions and practice, can materially and perhaps unnecessarily control a plant's position in the economic table. Under such conditions the question of modernisation and mechanisation should be constantly under review, possibly on new and as yet unexplored lines of thought. Differing opinions were also expressed by the team as to the best guide for relative manpower, and Table 2 provides a comparison of the various methods suggested.

Table 2.

	A	B	C	D	E	F
Therms per man per day	779	686	742	460	599	404
Retorts per man per day	2.1	3.1	3.0	2.3	2.2	1.8
Tons per man per day	9.1	9.3	8.5	5.7	6.9	5.5

It was the team's contention that tons carbonised per man per day was the most proportionate guide.

Fundamental Aids

In addition to the special recommendations given for each works the team put forward the following general fundamental aids for establishing efficient, economical and satisfactory retort house working:

(1) Always use debreezed coke on producers.
(2) Use fanned air supply to producers, automatically controlled to maintain steady producer gas flue pressures.
(3) Maintain coal quality of uniform carbonising rate and swelling index.
(4) Breeze sizing of up to ¼ in. is considered an advantage provided a use or market for this fine breeze can be found.
(5) Application of steam/water sprays to the coke extractor is very desirable to control the dust arising during the coke discharge.
(6) Retort house cleanliness was most evident where vacuum cleaning plants operated with fixed pipe connections to platforms.

In Group B, the intermittent vertical retort group, three out of the four plants comprising it, were of modern construction and varied between 13 months and 3½ years old. The fourth plant, however, had had most of the settings built originally in 1909 to the Dessau pattern. This great divergence in age and type gave the I.V.C. team the opportunity of comparing the difference between the small retort carbonising 9 cwt. per charge and the modern chambers of up to 4.2 tons capacity. A general comparison of results obtained from these plants is shown in Table 3.

Table 3.

	G	H	J	K
No. retorts or chambers	72	90	8	9
Max. capacity in tons per day	550	80	30.8	40
Weight per charge ...	4.13	9.0	2.15	2.31
Steaming %	2	8	10	*
Therms per ton ...	75.9	74.7	83.9	88.6
Therms per man ...	1,180	306	410	385
C.V. of finished gas ...	478.3	480.2	479.1	475.2
Load factor ...	100%	100%	45%	50%
Vol. matter in coal ...	29.7%	33.4%	33.8%	29.3%

* Not determined.

At the time of the inspection, plant G was one of the most modern in the country operating under base load conditions with mechanical producers and using producer gas as diluent. This particular plant, therefore, was taken by the team as more or less a yardstick for comparative purposes.

The inspection showed that very good yields could be obtained from the older pattern plant, but accurate comparison with the larger modern plant, operating under 100% load, was somewhat difficult, owing to the very great difference in coal quality. Results from the two smaller modern plants indicated the high yields obtainable where the load factor is such as to allow long carbonising periods. The older pattern plant, while showing a very good yield in therms per ton, fell very short in therms per man. Although reasonably comparable with the smaller type of modern plant, and operating at the same load factor at the time of the inspection, the small modern chamber showed a marked advantage when assessed on the maximum load basis. Under base load conditions both of the smaller modern plants could operate without additional labour to give at least 700 therms per man. The examination of the I.V.C. plants showed that the modern type, whether fitted with industrial vacuum cleaners or not, could maintain an exceptionally high standard of cleanliness.

Inspection of producers showed in one case the damaging effect of high moisture content in coke fed to the fires. Assessment of free coke in clinker by visual observation only was considered to be a too casual method and liable to lead to a wrong impression of the efficiency of the producers. On the three works fitted with normal built in producers, the free coke in the clinker, after hand picking, was assessed at between 5% and 8%, which in itself represents about 1½% of the actual carbon fed to the producers. This, however, gave no indication of the total carbon lost in clinker compared to the plant fitted with modern mechanical producers. At this latter plant, complete analyses of producer ashes were available which showed that such ashes, in which not the slightest trace of coke of any appreciable size was visible, gave a carbon content of 10%. This amount of carbon represented 1.5% of the original coke used on the producers.

Fair Report

Group C, horizontal retort plant (large). The technical auditing of plants which have been built some 20 to 50 years ago requires a great deal of understanding of the difficulties associated with their operation in order that a fair report can be presented. By employing a team of auditors whose normal daily work covered the control of this class of plant, the Board obviated the possibility of receiving recommendations the cost of which would prove to be out of all proportion to the improvements they could achieve in efficiency. This section of the audit covered six plants varying in productive capacity from 1.5 mill. cu.ft. per day to 7.0 mill. cu.ft. per day which were operating on a load factor of between 80% and 100%. Thermal yields varied between 67 and 72% according to the class of coal in use and method of dilution adopted, while the output in therms per man varied between 227 and 534. The latter figure was obtained on the plant of the shortest overall life.

Recommendations made by this team were more numerous than found with the other sections already mentioned, but, apart from a criticism on the use of compressed air for charging and discharging machines in part of one of the plants, they revealed no fundamental fault. One fairly common form of loss of efficiency was the rejection of good coke in producer clinker and ashes. In some cases this loss amounted

to as much as 35%. Visible coke could only be reduced to about 15% after hand picking for the collection of boiler fuel or for re-use on the producers. Since the minimum amount of visible coke found in the ashes was 25% before hand picking it was very evident that here was a case for the introduction of some method of clinkering the common step grate producer, or evolving a type of grate which would considerably reduce this form of loss.

Group C, horizontal retorts (medium-mechanised), was large enough to warrant the use of two separate teams to cover the eleven works selected for audit. All these works came within the range of four to seven beds with six or eight retorts in each bed of the common 21 in. by 15 in., 22 in. by 16 in., and 24 in. by 16 in. sizes, D shaped. Of these plants, five were operating at, or very close to, full normal load and the remainder varied to a minimum of 57%, which covered one case only. Thermal results differed considerably, showing a yield of 61 as the minimum and 73.3 as maximum. Likewise, the calorific values of gas produced ranged between 450 and 525 B.Th.U. per cu. ft. The greatest divergence in any result was the output in therms per man with the lowest works showing 77 and the highest 437. It would be reasonable to assume from such results that the former works was operating on a very low load factor but in actual fact it was the only works in the group operating at full 100% load.

So much for the first audits and the report which followed from them. These reports in their entirety were submitted to the divisional general managers for further consideration after which the implementation of all or any of the recommendations became the responsibility of the divisional general manager concerned in collaboration with the Board. In order that the results of the introduction of the recommendations of the teams could be assessed, or how many of such recommendations had been adopted, it was agreed that a second audit should take place about 12 months after the first.

Variations between the results obtained on the first and second visits were to be particularly noted and any discrepancies accounted for. Where special recommendations had been made and were not adopted by the management explanations for their omission or non-adoption were expected. It was generally found that where recommendations had not been complied with there were adequate reasons for not doing so. In some cases these recommendations were discarded as not suitable for the particular plant after reasonable trial.

After the completion of the second audit, and the subsequent examination of the various reports, the question was raised as to whether further audits were justifiable and if so what form such audits should take. In their deliberations on this question, the divisional general managers' committee was unanimous in the opinion that these audit visits should be continued but so extended as to cover other sections of the works. Three extra sections were added to the report sheets and designated C, D, and E.

Section C was arranged to cover the source and usage of water on the works with special attention to alternative supplies and their bearing on economical use.

Section D was to cover steam generation, distribution and utilisation. Boiler plant of all descriptions with associated ancillaries, fuel used, feed water, steam mains and steam-driven machinery would be included.

Section E was to be concerned with electricity usage and generation where practised.

Responsibility for this additional work was entrusted to the same teams employed previously and using the same grouping as before. Group D, horizontal retorts (medium-mechanised) had, at this stage, dwindled from a total of eleven to three works through the progress of centralisation of production at the most economic works and extension of the East Coast grid. How much this closing down of these smaller works was due to reports submitted by the auditing teams is not possible to say since there was a general policy of integration within the Board's area. Reduction in the size of this particular group allowed extra plants to be added to it and one section only was enough to cover the remaining works.

Whether or not it was a wise decision to cover the sections dealing with steam generation and electrical generation with the same teams as used on carbonising practice is a very debatable point. The fact that these somewhat specialised subjects were coupled to the general audit was probably accountable for this decision. It is the author's contention, however, that such items of plant should be treated separately and if possible by a specially selected team. Steam and electricity generating plants are generally comparable whether fitted to C.V.R., horizontal retort or I.V.C. plants. Therefore, there seems little, if any, advantage in utilising teams selected for their special experience in a particular type of carbonising plant for a critical examination of other pieces of plant on which they may not be so well qualified. With this in mind, should the auditing be continued beyond the point where it has already been carried in the Board's area? If the answer is yes, what item or section of plant could be tackled next? A suggested list of possibles remaining on the works side are: (1) coal handling, (2) coke handling, screening and distribution, (3) plant maintenance, (4) gas transmission and pumping.

Presumably the Board have found that the audits were successful or else they would have been terminated before now. One aspect of this success which cannot be measured in terms of improved yields, better working conditions or reduced cost was the great benefit every team member derived from the discussions and free exchange of experience and knowledge, before, during and after the audits. Most of the team members contend that the audits are justifiable for this reason alone.

From a paper to the East of Scotland Junior Gas Association, January 11, 1958

Experience with a Roller Grate Producer

By J. J. HALDANE,

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THE 11R retort bench at Dunfermline is made up of 12 62-in. W.-D. lambent heated retorts. Producer gas for heating the bench is supplied from a set of external producers housed in a building adjacent to the retort house, and is conveyed from a collecting flue at the back of the plant by two trunk necks passing through the retort house wall into a bus flue. The set comprises two producers with a grate area of 58 sq. ft. and one with an area of 39 sq. ft., the latter being situated between the two large ones and numbered consecutively 4, 5, and 6. To install the roller grate it was necessary to isolate No. 6 producer from the producer gas stream. This was done by building brick walls, one in the producer gas collecting flue between Nos. 5 and 6 and in the neck at the rear of No. 6. When this work was completed the producer was completely dismantled, leaving only the back and side walls and, of course, the wall common to No. 5.

The roller grate producer comprises five pairs of hollow rollers, each perforated for the introduction of steam and air, and fitted with breaking ribs for extracting ash when the rollers are rotated. A pinion wheel is fitted at one end. The grate, complete with cast iron side frames, back and front roller supporting frames, and rolled steel supporting members was built into the producer brickwork. The area of the grate is 48 sq. ft. The grate is driven by a 7½ H.P. electric motor through a worm reduction gear by means of a chain drive to the roller driving shaft which is fitted with worms to mesh with the pinion wheels on the rollers. The motor is reversible so that the grate may be rolled in the forward and reverse directions. A sliding pointer rides on a cam attached to one roller to indicate the top and bottom limits of the roll, *i.e.*, the top limit shows that the perforations are uppermost, and con-

versely, when the pointer is at the bottom limit, the breaking ribs are at the top.

The water and steam system is made up of two L-shaped water jackets built into the side and back walls. A steel drum with the usual fittings acts as a steam receiver incorporating a feed water regulator and a low water level alarm. The drum is erected on a platform at the side of the producer to maintain a head of water to the side jackets. The water supply to the drum is from an overhead tank of 720 gal. capacity. There are two water sealed headers, one connected to the drum and the other common to both side jackets, each set to prevent the steam pressure exceeding 3 lb. per sq. in. During erection the steam and water system was hydraulically tested to 50 lb. per sq. in. for 30 minutes. Previously each vessel had been tested and stamped as having withstood the test in the factory. Because of the low working steam pressure, 3 lb. per sq. in. maximum, the system is not considered a steam boiler under Section 29 of the Factories Act, 1937, and therefore does not required to be examined annually by a boiler inspector. Live steam is made available to the drum through two reducing valves to augment the supply to the grate, should it be required.

Access doors are fitted above and below the rollers, through which the ash pans are withdrawn. Fire bars are fitted across the top doors to retain the fuel and a little steam is admitted to keep the bars and doors cool. An air chamber bolted to the front frame of the grate forms a manifold for the supply of air to the hollow rollers and also encloses the driving worms and pinion wheels. A pressure gauge fitted to this chamber shows the back pressure on the fire and so gives an indication of its condition. The blower system comprises an electric motor-driven air blower which delivers air through a 5 in. diameter throat set in a steel duct main with a diameter of 9 in. In the event of another roller grate being installed, provision has been left for connecting the new air duct between the existing one since the blower is capable of supplyin gair to two producers. A differential pressure gauge is fitted across the throat and from this the volume of air passing per hour can be obtained. Table 1 gives the volume of air passing per hour at various pressures.

Table 1

Pressure differential in. w.g.	Volume of air per hour at 30 in. Hg. and 60°F.
1.00	34,250
1.25	38,250
1.50	41,900
1.75	45,250
2.00	48,430

A butterfly valve is fitted into the main duct below the throat to control the air. Slides are fitted to the front of the air chamber, so that, in the event of blower failure, air can be drawn in by the venturi action of individual steam jets to the rollers. Steam for air saturation is admitted into the main duct just below the throat and it is regulated according to the blast saturation temperature required.

For lighting up the producer, the isolating walls in the producer gas line were removed and the producer brickwork made good before spreading good quality broken clinker (about 2 in. in size) over the rollers to a depth of 6 in. Water was introduced into the side jackets and steel drum and then a layer of hot coke, 1 ft. deep and 3 ft. in length, was placed in the centre of the grate away from the side jackets. On the third day the fire was 1 ft. 6 in. deep and 5 ft. long and tapering to within 1 ft. of the side jackets. The grate was given quarter of a turn in either direction. In this way the fire was gradually built up, the grate being rolled occasionally and a little steam admitted to the rollers to keep them cool. Air for combustion was obtained through the upper access doors. By the eighth day the grate was on gaseous firing and was connected to the producer gas line.

The roller grate has no curtain arch as has the normal step grate producer, but the producer gas is withdrawn through a central damper placed between the top charging holes to the producer gas flue. By this time there was a steam pressure of 2 lb. per sq. in. in the drum and the differential pressure gauge read 0.5 in. w.g., representing 24,000 cu.ft. of air per hour. The back pressure on the gauge was 1.0 in. w.g. and the blast saturation temperature 58-60°C. A typical gas analysis at this period was CO_2: 7.0%, O_2: Nil, CO: 26.7%.

The day after the producer gas from the roller grate was turned into the producer line, this producer was worked in conjunction with No. 4 producer, while No. 5 was being maintained as a standby. A few days later it was decided to recommission No. 5 producer and take off No. 4 in order to save fuel and also because of the appearance of brick in the ashes suspected of being from the arch. This was carried out and No. 4 producer was filled up with coke and sealed off at the dampers and the venturi pipes plugged to prevent air infiltration. For a further three weeks until an incident occurred, about which more will be said later, the roller grate and No. 5 producer worked together. The grate drive motor ran at 8 A, the water consumption was 20-30 gal. per hour, as indicated by a Rota Meter flow indicator, and coke consumption was approximately 6½ tons per day. Over this period the average producer gas analysis was CO_2: 5.8%, O_2: Nil, CO: 28.4%.

Too Shallow

Two thermocouples had been placed in the front of the producer against the side walls at a distance of 2½ in. below the bottom of the side jackets. At this level they were just in the ash bed and indicated the temperature at this point which should be maintained about 100-120°C. Too high a temperature would indicate that the ash bed was too shallow and that the hot fuel by approaching the rollers, might cause damage by expansion. On the other hand, if the temperature fell below 100°C. the ash bed would be too deep and cause a loss of efficiency. Other means of determining the condition of the fire is provided by rodding holes in the bottom of the upper access doors. A ¾ in. diameter rod is inserted through the hole and pushed right to the back wall. After 75 seconds the rod is withdrawn and it should be bright red along its length. If there are any dark parts on the rod further rolling must be carried out to eliminate a build up of ash. By combining the use of the thermocouples and dip rod reasonable control can be kept on the ash bed.

Rolling the grate must invariably take place with the air blast on, otherwise the air slots may become blocked with ash and they are very difficult to clean. Lubrication of the front roller bearings is by a high temperature grease in spring loaded grease cups and for the worms and pinion wheels a very high viscosity oil, 'Voler 1,000,' is used. The rear bearings are too inaccessible to be lubricated. Owing to the fineness of the ash, the pans have to be emptied after every roll. Under normal working conditions the time taken to roll the grate, two forward and two reverse, including the removal of the ash from the ash pans and its transport in a skip barrow to the ash hopper, was approximately 30 minutes.

The advantages of this type of producer are:—

1. There is always a constant quantity and quality of producer gas. It has been found that good quality gas is available 15 minutes after rolling and charging the fire, such as CO_2, 5.2%; O_2, nil; CO, 29.3%; which is far superior to gas made in a step grate producer under the same conditions.

2. The only manual work required is to remove the ashes from the ash pans and transport them to the hopper.

3. A very low carbon content of the ash at between 5 and 7% is obtained compared with anything up to between 17 and 25% in the manually cleaned step grate producer.

The disadvantages of this producer are:—

1. Although the roller grate used roughly the same amount of fuel as No. 4 producer it did not make as much producer gas as will be seen from the following comparisons:—

While working the roller grate with No. 5 producer, the producer gas serving 12 retorts at a pressure in the collecting flue of .02 in. w.g., it was necessary to run the roller grate with a differential pressure of 1.75 in. w.g. *i.e.*, 45,250 cu.ft. per hr. and the steam to No. 5 producer above 70 lb. per sq. in. This, of course, entailed extra rollings, as many as ten per day, to keep the ash bed down and consequently an increase in fuel consumption. When the roller grate was put off for examination Nos. 4 and 5 worked with a steam pressure of about 35 lb. per sq. in.

2. Since there is little or no market for coke between ¼ in. and ½ in., this size is used to a large extent in the producers. An average sizing analysis of producer fuel was; above ½ in.—30%, ½ in. to ¼ in.—40% and below ¼ in.—30%. It was frequently found that because of the wide space of 2½ in.

between the rollers and the side walls, the fuel would start to run out at this point during rolling. This space was left to permit larger pieces of clinker to pass during the reverse roll when the outside rollers were turning downwards towards the wall. Coke made from Fife coals caused no clinker to be formed so that the gaps were superfluous.

3. Should any hard foreign body inadvertently be admitted into the producer and jam the rollers the grate drive motor will trip out through an overload switch. Such a stoppage may be of short duration if the obstruction can be removed without shutting the producer down, otherwise it would mean a shut down of the roller grate and emptying it to remove the obstruction. If this should happen, there are 24 hours in which to get another producer put to work, which is virtually impossible, or sufficient retorts must be put off to enable the other producer to cope with the remainder. This problem would not be quite so serious at Dunfermline if Nos. 2 and 3 retort benches had a common producer gas bus flue but as they are separate the position could be critical.

4. After the producer had been working for about three months, pieces of brick were observed in the ash. As these pieces became more frequent it was decided to empty the producer to identify their source. It was discovered that owing to the construction the brickwork set on the cast iron side frames was over-lapping by 6 in., and the bricks were being broken off at an angle of approximately 45° by the shearing action of the ash. The fact that these bricks were broken caused fuel to run through the gap as was mentioned earlier.

The contractors have been notified of the foregoing troubles and they are shortly to carry out alterations to eliminate the worst features. Tapered bricks will be used to replace those that are broken and strips of cast-iron are to be fitted to the side frames to reduce the gap between the frames and rollers. It has also been suggested that deflecting plates should be fitted to the brickwork below the rollers to divert the ash into the collecting pans since trouble has been caused at times by ash spillage down the sides of the producer which has resulted in the jamming of the pans in their bays.

It must be remembered this is the first roller grate producer of its kind to be installed in Scotland and there were bound to be teething troubles though those that have been installed in England are understood to be giving good results. Perhaps, therefore, once the difficulties experienced at Dunfermline have been rectified, equally good results might be expected in Scotland.

GAS IN FRANCE

Report on Production Research

THE *Journal des Usines à Gaz* of January began a three-monthly chronicle of the activities of the Research Department of Gaz de France. The information is not to be used practically until official instructions are received, readers are warned.

The first report covers principally the work of the Centre of Tests and Research at Landy on the production and treatment of gas, the activities of the Department of Industrial Tests being mentioned in less detail. It comes under the following headings:

PRODUCTION.

The P9 Generator.

A new, simplified process for reforming propane in steam has been developed to the pilot stage in a generator known as P9. It is a cyclic process, devised by A. Bolzinger, in which a portion of the gases produced is recycled after having vaporised, by its sensible heat, in a hydraulic main type of saturator, the water necessary for the reaction. The apparatus, which differs from other processes by the absence of a steam boiler, is simplified by a number of technological innovations which reduce the length of the circuits and facilitate manipulation in the course of the cycle.

Industrial Stage

The process results in the production of a gas of relatively low calorific value which, after mixing with propane and the products of combustion, supplies a gas of 4,500 mth/m³ (470 B.Th.U. per cu.ft.) containing less than 5% of CO_2 and perfectly capable of substitution for normal town gas. The overall efficiency of the process is approximately 75%. Development at the industrial stage is now contemplated.

Catalysts

A fairly high proportion of the town gas used today results from the reforming or cracking of petroleum products. The processes used may be purely thermal or thermo-catalytic. In order to solve a number of problems which have already arisen and are likely to arise in the future in all these processes, whether cyclic or continuous, a study of the catalysts used has been undertaken in the following forms:

(1) A systematic examination of the catalysts now in use by Gaz de France, in order to establish criteria by which they may be selected and to verify their quality on delivery and after more or less long service. This requires, on the one hand, laboratory apparatus in which the catalyst may be studied at work in conditions similar to those of the industrial process for which it is used or to be used; on the other hand, an examination of the characteristic physical properties of the catalyst, its density, true and apparent, the calculation from these data of its porosity, the determination of its specific surface, the examination of its acidity, and finally the measure of its mechanical strength and resistance to thermal shock.

(2) Investigation into the diverse questions which have been raised in operation, such as

(a) Control of the permanence of the qualities of catalysts in successive deliveries (tests of conformity).
(b) The longevity of the catalyst, *i.e.*,—the permanence of its activity after usage (in the case of cyclic processes) or after regeneration (in the case of continuous processes).
(c) Examination of resistance to the sulphur of the raw material in the case of continuous processes and of resistance to thermal shock in the case of cyclic processes.
(d) A study of the possible interchangeability of catalysts or that of a new or existing catalyst in view of its utilisation in new processes.
(e) Finally, the explanation of anomalies arising in operation.

It is not proposed to study the preparation of catalysts.

THE IMPURITIES OF PROPANE.

In order to prevent the poisoning of catalysts the Direction of Production and Transport had asked the Research Department to devise a simple and rapid method of control of the deleterious sulphur content of propane to be used in gas production. The Centre of Tests and Research at Landy has arrived at a solution of this problem.

It is important to note that the sulphur contained in propane may be found either (a) in the volatile state, the most harmful because it comes off in the gaseous phase, or (b) in a solid or liquid state (free or combined) in the residues of evaporation. To discriminate between the two, samples of propane for analysis must be taken from the tanks exclusively in the liquid phase in receptacles of Plexiglass specially designed for this purpose.

(a) The determination of sulphur in the gaseous phase. Sulphur compounds volatile at 60°C. (it is necessary to specify the temperature because some substances, *e.g.*, the disulphides, have a vapour tension which is neither nil nor very high at ordinary temperatures), which is about the temperature of the vaporisers, are converted to H_2S at 900°C. over a platinum

catalyst in the presence of hydrogen. The apparatus is simple; several sets will shortly be available for use. The H_2S produced is estimated colorimetrically, the graduations being such that the sulphur content of the sample is seen at a glance.

(b) For non-volatile compounds, the sample is evaporated and the residue, consisting of oil, sulphur compounds and free sulphur, is weighed and its sulphur content determined by a modified Gröte method.

INDUSTRIAL TESTS.

Tests of Onia-Gegi sets fed with non-selected heavy oils have as yet only yielded partial results. The preliminary vaporisation on the chequers, which could permit the use of crude oils, has not yet been satisfactorily accomplished. A new series of tests is therefore contemplated, comprising between the phase of heating on the chequers and that of the atomisation of the oil, a short phase of reduced temperature of the upper part of the chequer-work, designed to obviate thermal cracking of the oil, which is the cause of the difficulties encountered during previous tests.

In the meantime it has been possible to pass direct to the catalyser fuel oils selected with a Conradson figure up to 10 by mixing them with light distillates (gas oils, paraffin distillates).

A final series of tests has been carried out on the Stark plant at Saint-Brieuc. The breakdown of the results is now in hand and will be reported later.

The first tests of the Thermofor process have led to certain modifications of the apparatus. The tests will be continued shortly with a view to the continuous reforming of propane, butane and light spirits for the production of a perfectly interchangeable gas.

GAS TREATMENT.

Elimination of gums.

It is agreed that the formation of gums can be attributed to the nitrogen dioxide present in gas which gives with the oxygen nitrogen peroxide, which catalyses the polymerisation of certain non-saturated hydrocarbons. Previous research led to the view that the compounds which participate in these reactions are essentially the diethylenic hydrocarbons. Following recent tests at Landy it seems that certain monoethylenic hydrocarbons may also participate in the formation of gums. Tests to prove this point will be undertaken very soon.

Sharp Condensation

The oxydation of the dioxide of nitrogen is relatively slow and gums appear in notable quantity only after a sufficient stay in the gasholder. Their coalescence and their elimination can be provoked by a sharp condensation of water vapour, injected into the gas at the holder outlet. Tests at Landy gasworks appeared encouraging and may be completed by new tests in preparation at the Gennevilliers works. Other processes are also contemplated which will be compared, economically and technically, with that now under test.

Chemical purification.

(1) By granulated materials: The use of these is contemplated for the purification of natural gas and laboratory tests with anhydrous gas are now in hand.

(2) The fluidised bed: In spite of its attractions, this technique still presents particular difficulties. The dense fluidisation, used in the G.D.F.-Bolzinger process, requires a very thorough preliminary elimination of tar. A detarrer has been added to the apparatus and a new series of tests undertaken.

EFFLUENTS.

The study of the dephenolisation of residual liquors, carried out at Landy, depends on the utilisation of a bacterial stock isolated and cultivated specially by Professor Raynaud of the Pasteur Institute. This species assimilated the different phenols present in the liquor, using them as the source of carbon necessary for its growth. If the conditions are favourable (presence of nutritive salts, *p*H, temperature . . .) the phenol content of the liquor, after inoculation and with an intense aeration, decreases fairly rapidly to values of the order of some milligrams per litre. This investigation has been carried on a semi-industrial scale at Landy in the following conditions:

(a) The liquors treated are residuals of a concentrated ammonia plant, containing only traces of cyanides and sulphides which poison bacterial activity when present to the extent of more than some hundreds of milligrams per litre.

(b) The initial phenol content of the liquor must be less than 1 gram per litre—if not the liquor must be diluted—above this, bacterial activity is paralysed.

(c) The *p*H must be between 6.5 and 7.5 to assure a convenient development of bacterial activity.

(d) Nutritive salts consist of phosphate of ammonium and traces of magnesium salts. The phosphate content may be about 300 milligrams/litre.

(e) Aeration of the liquor in course of treatment (oxygen is an essential element in bacterial life) is effected by agitation by means of a fan which blows in air and divides it into very fine bubbles favouring a rapid exchange of air with the liquor.

(f) Temperature must remain between 25 and 30°C.

A typical operation of dephenolisation is effected in about 20 to 25 hours, the residual phenol content being 5-10 milligrams per litre.

Certain difficulties have appeared: Retardation in bacterial development, ageing of the 'stock,' contamination by germs brought in with the air, etc. Modifications of the process appear interesting under snap tests, which are to be confirmed by a new apparatus now to be constructed.

High Pressure Distribution of Propane

EARLY in 1953, a small system of distribution of propane at a relatively high pressure was brought into operation in the little village of Petit-Fercourt in the department of Oise in the Commune of Sainte-Geneviève. The village, which has about 60 consumers, is about 2½ miles from the nearest gasworks. The distribution system of Sainte-Geneviève, composed mostly of mains of small diameter, was already overloaded and consumers in the direction of Petit-Fercourt were poorly supplied. The installation of a system for the high pressure distribution of propane from Petit-Fercourt was a solution to the immediate problem of providing for the adequate supply of this village, and also allowed for the future modernisation of the main system of Sainte-Geneviève which has inadequate dimensions and is in defective condition.

About two miles of mains were laid in Petit-Fercourt with 73 services, the number of consumers having increased by about a dozen during the work. After two years of satisfactory operation the propane system was extended to the whole of the Commune of Sainte-Geneviève and nearly 300 consumers are now supplied from the station at Petit-Fercourt through about 5½ miles of main.

At present, propane is received in mobile containers, but it is possible that fixed reservoirs will be installed in the future. Pressure is reduced from the containers to 1.5 kg/cm² (say 22 lb. per sq. in.) at outlet to mains. The principal mains are of steel, 40 mm. (1.6 in.) diameter, secondary mains are of copper 20/22 and 14/16 mm. diameter. Service pipes are of copper 8/10 mm. diameter.

More Economical

Interior installations consist of a reducing apparatus, of a type developed by Gaz de France, leading to a Rockwell meter. This arrangement is considered to be so cheap that the system is more economical than distribution at low pressure. Details of mains and services and ancillary equipment are given, with drawings, in an article by M. Michel Scart in January's *Journal des Usines à Gaz*.

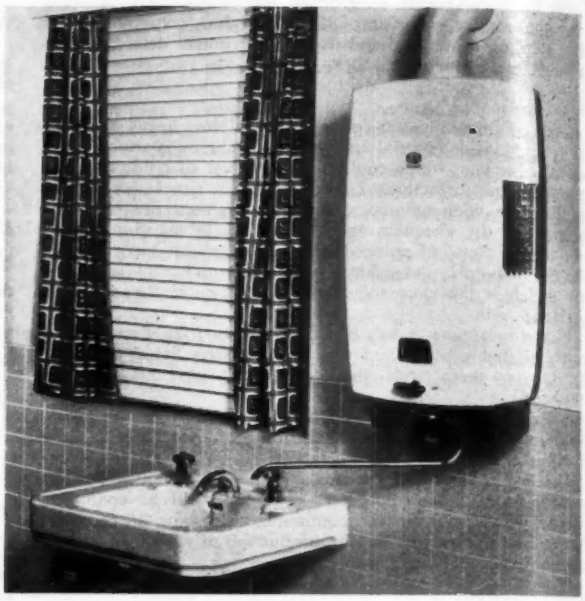
Earth Satellites Explained

THE circulation of the earth by man-made satellites may be less of a wonder to some under 12-year-old 'space-men' than it is to the many hundreds of thousands of grown-ups who find it difficult to understand these recent events.

A special number of *Oil-Power* has been devoted by the Socony Mobil Oil Co., Inc., to explain the research into the physics of outer space, which has taken place in the United States of America to make possible the launching of earth satellites. By its comparatively simple treatment of a complex subject, it reveals some of the significance of recent events.

Main 'Triton' Instantaneous Water Heater

NEW PRESSURE-TYPE MULTI-PURPOSE APPLIANCE ON GAS COUNCIL LIST



MAIN WATER HEATERS, LTD., announce the introduction of a new pressure-type multi-purpose instantaneous water heater—the 'Triton'—which has been accepted for inclusion in the Gas Council's List of Tested and Approved Domestic Gas Appliances. Compactly designed and contemporary in style, it can be installed to meet a variety of domestic hot water requirements.

Fitted in the bathroom it can be used as a single-point bath water heater, but it can equally well be used as a dual-point water heater to supply both the bath and the hand basin, either by means of a swivel spout or by connecting its hot water outlet to the taps at these two points. Alternately, it can be installed in any convenient position for remote controlled multipoint supplies to the kitchen sink, bath and hand basin.

Sturdily constructed of the most durable materials, the 'Triton' has been designed with a view to the greatest possible simplification of installation, maintenance and cleaning. A particular feature of the 'Triton' design is the incorporation of the draught diverter within the casing, with streamlined escape outlets positioned at the sides of the heater.

The outer casing consists of a back panel, to which are attached the four side panels. The lower panels carry the base cover in which the deposit tray is fixed. The front cover is sprung on to the side panels and is easily removable for servicing.

Three Units

Internal construction comprises three units; draught diverter, heating unit, and burner and valve mechanism, each independently mounted on the back plate and each separately removable as necessary, without dismantling the complete heater.

The water control cock can be used as a stop cock for maintenance purposes, thereby enabling the heater to be disconnected without cutting off the water at the main. A water throttle, filter and drain plug are also fitted.

The features of easy accessibility of components for fixing and maintenance, together with its compact overall size—the heater body measures only 30½ in. high by 15½ in. wide by 9 in. deep—make the 'Triton' the ideal appliance for fixing in a restricted space. It will operate satisfactorily even if fitted in an alcove with the walls only 6 in. away on either side, and the headroom required can be as little as 9 in.

Water supply can be either from a tank or direct from the mains. If a tank supply is used, the minimum operational head required is 7 ft. 6 in. above the base of the heater; or in the case of the multipoint version, above the highest draw-off point.

The gas control cock is provided with stops for 'off,' 'pilot on,' and full 'on.' The spindle is spring-loaded and the control handle must be pushed in before it will pass from the 'pilot on' to the full 'on' position. An arrow on the front of the handle clearly indicates its position. A gas throttle or a pre-set gas pressure governor are supplied as extras.

A differential pressure type automatic valve is incorporated and ensures that gas cannot pass to the main burner unless water is flowing through the heater. Two-stage and easy ignition is provided for and the burner incorporates a pilot safety device.

Outlet is 2.5 gal. per minute raised 40°F., 1.66 gal. per minute raised 60°F., and 1.25 gal. per minute raised 80°F. *Gas rating* is 75,000 B.Th.U. per hour or 150 cu.ft. of 500 B.Th.U. gas.

The *finish* is front casing and side panels in white or cream vitreous enamel with base cover, side louvres and back plate in black enamel.—*Main Water Heaters, Ltd., Gothic Works, Thornton Road, Croydon.*

Trade News

New Compact 'M.V.' Dry Air Filter is Cheaper to Install and Maintain

TO meet the demand for a more compact and inexpensive unit, the Visco Engineering Co., Ltd., have developed their new 'M.V.' type dry air filter. This occupies only about two-thirds the space required for a 'C.E.' filter of equal capacity, and is appreciably cheaper to install and maintain.

Each 'M.V.' filter comprises a frame and a removable cell. The cell consists of two sections which fit together to hold the filter pad firmly between them. The two sections are fixed rigidly together for easy and safe handling. The assembled cell rests on the side cheeks of the frame and is firmly clamped to a felt seating.

The overall size of the filter unit is 20 in. by 20 in. which is the same as that of this Company's vertical panel type oil-wetted air filter. This means that where two-stage filtration is required both types of filter can be fitted into the same housing.

The 'throw-away' filter pads are made from a new synthetic fibrous material which has been thoroughly tested for air filtration efficiency. The fibres of the material are not dislodged by air movement and the raw edges of the pads are on the dirty side of the cell thus eliminating the possibility of fluff being picked off into the air stream. Replacement pads are inexpensive and easy to fit.

Capacity per unit is 750 c.f.m. with initial resistance of 0.125 in. w.g. Initial resistance at 625 c.f.m. is 0.09 in. w.g. Efficiency is high at 99.9% on a weight basis when handling air of normal atmospheric dust content. The weight of the complete unit is 39 lb. The weight of the cell only is 17 lb.

The Visco 'M.V.' type dry air filter will give several hundred hours operation under normal conditions without changing the filter pads. Where heavy dust loads are encountered, it is recommended as a secondary stage to follow an oil-wetted filter of the same dimensions.—*The Visco Engineering Co., Ltd., Stafford Road, Croydon.*

Welding Copper Cable to Pipes for Applying Cathodic Protection

THE Mapelweld process is a simple inexpensive and efficient method of welding copper cable to steel or cast iron where no external heat or power source is needed. For operation the contact surface must be cleaned and dried—on cast iron the weld point should be cleaned and then 'roughed up' to provide a key for the weld.

The metal disc is inserted into the mould and the charge tipped in on top in one movement to ensure that the starting powder in the bottom of the container is uppermost in the mould. The mould is then placed on the prepared surface and the stripped end of the cable is inserted into the mould as far as possible. The charge is then ignited with the flint gun. The result is a tight, permanent welded joint, having a current carrying capacity at least equal to the conductor.

Continuity Essential

When cathodic protection is applied to a pipeline it is essential for the line to be electrically continuous and if Viking-Johnson couplings, or similar electrically insulating couplings are used each joint must be bonded to give the necessary continuity.

The Mapelbond is 1 in. by $\frac{1}{4}$ in. copper bar with tails for Mapelweld (thermit welding) to the pipe on each side of the joint, the centre portion of the wire being bonded into the sleeve, using either a thermit weld or a special connection in the top plug of the sleeve. The wire is also fitted in slots in the rings and the slots then peened over.

The bond resistance can be easily controlled by modifying the section of copper bar according to the design of the cathodic protection scheme, the only limiting factor being the current carrying capacity of the copper wire, which in the case of large diameter lines could be increased to 7/064.

This type of bond makes possible the use of impressed current to protect many miles of pipeline with one installation where previously the length of line to be protected was limited by the bond resistance. In addition, this type of bond does not cause damage to the internal coating of steel pipelines.

The Mapelbond installed when laying the pipeline will enable a cathodic protection scheme to be successfully applied at any time in the future, even when coating and wrapping is completely deteriorated, without the expense of locating and excavating the joints.—*Metal and Pipeline Endurance, Ltd., Artillery Mansions, Victoria Street, S.W.1.*

RADIATION TO MAKE U.S. APPLIANCES

RADIATION LTD. have entered into an agreement entitling them to manufacture for the home market and certain overseas territories the wide range of warm air appliances devised by the Eureka Williams Corporation of America. The agreement also provides for the mutual exchange of technical information about design and production methods.

Ducted warm air, as a controlled means of domestic heating, was pioneered in this country by Radiation Ltd. This method is now more readily accepted not only for houses, but for schools, shops, halls and similar buildings, because of the high standard of comfort it affords.

It is, however, much more widely used in America and the link between the two companies will further enhance the high standard of development that has been achieved in the past 10 years.—*Radiation Group Sales, Ltd., 7, Stratford Place, London, W.1.*

IMPROVEMENT TO WELDING ELECTRODES

MODIFICATIONS which will bring about an improvement in the performance of the low-hydrogen type of electrode are announced by Quasi-Arc Ltd.

The high weld-metal quality given by these electrodes is dependent to a large extent on the formation of a gas shield round the arc. In the short period of time which elapses after striking the arc and before the gas shield has formed, porosity may occur.

To eliminate this problem, a paste of special composition has been developed which can be applied to the tip of the electrodes after the normal coating has been extruded on the core wire. The tip is designed to generate shielding gases as soon as possible after the arc is struck.

The welder can now deposit a bead without the necessity of 'running back' over the start of the weld to eliminate porosity. Arc striking is easier since repeated tapping or scratching is no longer necessary and the arc strikes as soon as the electrode is applied to the workpiece.—*Quasi-Arc, Ltd., Bilston, Staffs.*

HEAVY DUTY DUMP LOADER DESIGNED FOR 5 TON LOADS

A SPECIAL dump trailer has been introduced by Whitlock Bros., Ltd., for carrying rock and other heavy materials. Designed for a load of 5 tons, tipping is by twin hydraulic rams placed underneath the body and the positive control of the tipping movement from the tractor driver's seat enables the load to be evenly spread when so required.

Sloping sides of the body and scow combined with a tipping angle of 62° and high clearance ensures trouble-free dumping of the load. A low centre of gravity gives maximum stability when travelling over rough ground.

The body is 9 ft. 2 in. by 7 ft. by 2 ft. deep of pressed steel construction on channel steel frame reinforced with inverted steel angles.—*Whitlock Bros., Ltd., Great Yeldham, Essex.*

New 4-ton Crane added to Jones Diesel Mechanical Range

A NEW 4 ton crane has been added to the range of Jones diesel mechanical models distributed in the United Kingdom by George Cohen Sons and Co., Ltd. The new KL 44B, as its name implies, is a modification of the KL 44 which has found great popularity throughout the world as a fast, sturdy crane with a reputation for maintaining its efficiency despite protracted heavy duty under arduous conditions.

Advantage has been taken of the fact that the exceptionally high operating speeds of the KL 44, while important on such duties as grabbing, are not required by every operator needing a 4 ton capacity machine. By modifying these operating speeds, it has been possible to introduce a less powerful, air-cooled diesel engine while maintaining the same lifting capacity, allowing considerable reduction in total price.

The new Jones KL 44B is complementary to the KL 44 and does not supersede it; full scale production is going ahead on both models at the Letchworth works of George Cohen's associates, K & L Steelfounders and Engineers Ltd.

The reduced hoisting speed of the KL 44B in low gear with maximum load on two falls of rope is 22 ft. per minute, slewing speed 2 r.p.m. and top travelling speed, 3 m.p.h. The 4 ton maximum lift is handled at 8 ft. radius. Two wheel differential is standard, but direct drive models are available if required.

Three Crane Motion

Up to three crane motions can be operated simultaneously—slew through 360°, hoist or lower with maximum loads, and derrick or travel as selected. The crane's manœuvrability and its ability to turn inside a tight circle allows it to work in confined spaces and at awkward angles.

A variety of jibs, both straight and swan neck, sufficient power to travel under load over difficult ground at extreme outreach makes the Jones 4 ton cranes the most versatile available on the market today.—*The George Cohen 600 Group, Ltd., Wood Lane, London, W.12.*

NEW TRADE PUBLICATIONS RECEIVED

BRITANNIA IRON & STEEL WORKS LTD.

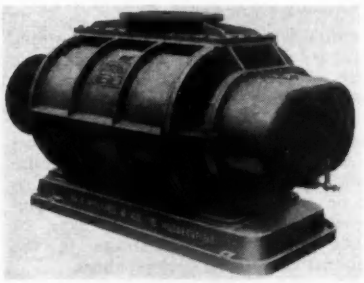
A BOOKLET to mark the 25th anniversary this year of their Britannia Iron & Steel Works at Bedford, has been published by Le Bas Tube Co., Ltd.

Recalling that from 1902 to 1932 the Company imported from Switzerland +GF+ brand malleable iron tube fittings, the booklet tells how, during the financial crisis of 1929 and onwards it was decided to make them in this country with the technical guidance of Swiss experts.

Since the Britannia works was completed in 1933 over 300 mill. British-made +GF+ fittings are now giving good service on water, gas, steam, air and oil piping installations throughout Great Britain and the Commonwealth.—*Le Bas Tube Co., Ltd., City Wall House, 129, Finsbury Pavement, London, E.C.2.*

Ciment Fondu

An entirely new publication on Ciment Fondu 'The Cement for Industry' has 32 pages, and is especially designed for maintenance engineers.—*Lafarge Aluminous Cement Co., Ltd., 73, Brook Street, London, W.1.*



TYPE RB POSITIVE AIR BLOWERS

A NEW publication, No. 71, gives details of the Type RB Holmes-Connersville positive air blowers, pictured here.

Although the 10 in. machine has been manufactured for some time the 12 in. machine has only recently been added to the range of roller bearing blowers. The 10 in. machine has been brought into line with the 12 in. machine which has the redesigned 'H' type casing. The blower featured on the front cover of the brochure has the redesigned casing.—*W. C. Holmes & Co., Ltd., Turnbridge, Huddersfield.*

TWO NEW FISHER ELECTRO-HYDRAULIC VALVE OPERATORS

THE Fisher Governor Co., Ltd., announce the new Fisher Type 340 and Type 350 electro-hydraulic valve operators. Recent trends towards electrical control loops have created a need for final control elements capable of utilising their greater sensitivity and speed. Fisher electro-hydraulic operators are self-contained electrically operated valve actuators, ideal for use in such control loops.

They produce high performance without the use of electronic amplification, employing only a simple DC electrical circuit to control the hydraulic pilot. The pilot systems incorporate no close fitting parts, but use simple nozzle-flapper combinations to control hydraulic pressure.

There are two sizes available, each adaptable to all DC output signals. The Type 340 has a maximum stem thrust of 600 lb. and is suitable for valve sizes from ½ in. to 4 in., while the larger Type 350 develops a thrust of 2,000 lb. and is usable for all valve sizes up to 16 in.

Both models are now in production and the Company can accept orders for delivery in 9 months. Full details of both are given in Fisher Bulletin E-350.—*Fisher Governor Co., Ltd., Airport Works, Maidstone Road, Rochester, Kent.*

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